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The prevalence of wholly attributable alcohol conditions in the United Kingdom hospital system: A systematic review, meta-analysis and meta-regression

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Complete List of Authors:	Roberts, Emmert; South London and the Maudsley Mental Health Trust, Institute of Psychiatry, Psychology& Neuroscience, King's College London , Psychological Medicine Morse, Rachel; Brighton and Sussex Medical School, University of Brighton and the University of Sussex Epstein, Sophie; South London and the Maudsley NHS Foundation Trust NIHR Biomedical Research Centre Hotopf, Matthew; Kings College London, Institute of Psychiatry, Academic Department of Psychological Medicine Leon, David; London School of Hygiene and Tropical Medicine, Drummond, Colin; Institute of Psychiatry, King's College London, National Addiction Centre
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Title:

The prevalence of wholly attributable alcohol conditions in the United Kingdom hospital system: A systematic review, meta-analysis and meta-regression

Authors:

Dr Emmert Roberts, National Addiction Centre and the Department of Psychological Medicine, Institute of Psychiatry, Psychology and Neuroscience, King's College London and South London and the Maudsley NHS Foundation Trust

Miss Rachel Morse, Brighton and Sussex Medical School, University of Brighton and the University of Sussex

Dr Sophie Epstein, NIHR Maudsley Biomedical Research Centre, South London and the Maudsley NHS Foundation Trust; Department of Child and Adolescent Psychiatry, Institute of Psychiatry, Psychology and Neuroscience, King's College London

Professor Matthew Hotopf, Department of Psychological Medicine, Institute of Psychiatry, Psychology and Neuroscience, King's College London and South London and the Maudsley NHS Foundation Trust

Professor David Leon, Department of Non-communicable Disease Epidemiology, London School of Hygiene and Tropical Medicine

Professor Colin Drummond, National Addiction Centre, Institute of Psychiatry, Psychology and Neuroscience, King's College London and South London and the Maudsley NHS Foundation Trust

Corresponding author:

Dr Emmert Roberts
National Addiction Centre, Institute of Psychiatry, Psychology and Neuroscience, King's College London
+447754156145
emmert.roberts@kcl.ac.uk

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Background and Aims: Prevalence of alcohol-related conditions is often reported as higher in hospital inpatients compared to the general population. However, formal prevalence estimates are commonly derived from small studies which report highly varied results. We report a systematic review and meta-analysis, within the United Kingdom hospital system, which aims to estimate the pooled prevalence of the twenty-six ICD-10 conditions that are wholly attributable to alcohol in inpatient settings.

Methods: We searched Medline, Embase, PsychINFO and CENTRAL from database inception until 1st May 2018. We included studies of any design which reported the prevalence of one of 26 wholly attributable alcohol conditions defined by the ICD-10. Studies were required to be conducted in one or more of the constituent nations of the UK, and in an inpatient setting (general wards, intensive care units, accident and emergency departments or mental health inpatient units). Estimates were pooled using random effects meta-analysis, and meta-regression tested study and patient factors contributing to variation. Quality was assessed using the Grading of Recommendations Assessment Development and Evaluation (GRADE) framework.

Results: 124 studies were included reporting on a total of 1,657,614 patients. The majority of studies reported on harmful use of alcohol and alcohol dependence, the pooled prevalence was 19·8% (95% CI 15·6% - 24·3%) and 10·3% (95% CI 7·1% - 14·0%) respectively. Mean patient age, and type of inpatient setting were identified as the main sources of variation in prevalence estimates, but not date of data collection. Both estimates were deemed very low quality according to GRADE.

Conclusions: We estimate that one in five patients in the UK hospital system use alcohol harmfully, and one in ten are alcohol dependent. Hospital clinicians should be vigilant at both screening, and initiating appropriate treatment to tackle this widespread issue.

Introduction

The prevalence of alcohol-related conditions is often reported as higher in hospital inpatients compared to the general population (1), however formal prevalence estimates are frequently derived from small studies which report highly variable results. Such estimates are also often restricted to subsets of patients with particular diseases (2), making it difficult to interpret the true overall prevalence of these conditions in the inpatient population.

Alcohol-related conditions are estimated to cost the United Kingdom (UK) National Health Service (NHS) approximately 3.5 billion pounds per year (3). In the current epoch of stretched financial resources, accurate quantification of their prevalence in inpatient settings is important to ensure appropriate resource allocation. Alcohol is a potential causative factor for a plethora of conditions (4), and without dedicated in-hospital screening many alcohol-related conditions may be missed, and not receive appropriate treatment (5). Accurate prevalence estimates are therefore vital to inform patients, clinicians, commissioners and policy makers as to the scale of the problem, and are currently particularly pertinent given the UK government's development of a new alcohol strategy and the NHS 10-year plan which includes funding allocations to combat alcohol-related conditions (6).

The current evidence base is confused and contradictory with a large range of differing prevalence estimates of alcohol-related conditions reported in the literature (7, 8). Previous attempts to synthesise data through systematic review have made no attempt to pool data, have been narratively reported and have either focussed on general medical inpatients, or on subpopulations of patients with particular conditions (9, 10). Reviews have also been narrowly focussed often reporting on a singular alcohol-related condition (11). As such no robust pooled estimates in the UK hospital system are currently available in the literature.

The UK uses the International Classification of Diseases - Diagnostic Criteria for Research Volume 10 (ICD-10 DCR) as the gold standard to code alcohol-related diagnoses (12). This defines a diagnostic classification system of twenty-six unique conditions which are wholly attributable to alcohol. A list of these, along with their diagnostic codes, is shown in figure one. We aimed to use meta-analysis to generate pooled prevalence estimates of these twenty-six conditions within the UK hospital inpatient system. Through meta-regression we aimed to test what study and patient factors contribute to any observed variation in prevalence estimates.

Methods

This study is reported according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (13), and in line with the Meta-analysis of Observational Studies in Epidemiology (MOOSE) checklist (14). The study did not require ethical approval.

Search Strategy

We searched Medline, Embase, PsychINFO and the Cochrane Central Register of Controlled Trials (CENTRAL) from database inception to May 1st 2018. The complete search strategies can be found in figure S1 the online supplementary material.

Study Selection

Three authors (ER, RM and SE) initially assessed titles and abstracts and reviewed the full text of the remaining articles for inclusion. Any discrepancy was resolved by discussion, and where agreement could not be reached a fourth author (CD) was consulted. All relevant references were checked for additional citations.

The review protocol can be found in figure S2 in the online supplementary material. We included studies of any design, using any method of diagnostic ascertainment, that were reported in English, and contained data which enabled the calculation of a prevalence of any of the twenty-six wholly attributable alcohol conditions as coded in ICD-10 (12). Included studies had to be conducted in one or more of the constituent nations of the UK (England, Scotland, Wales or Northern Ireland), and report a prevalence in a hospital setting. The setting was defined a priori into four groups: general medical or surgical wards, intensive care units (ICU), A&E or mental health inpatient units.

We excluded studies conducted in specific substance misuse inpatient settings such as detoxification units or rehabilitation centres. We also excluded studies which reported only a prevalence of ‘alcohol use’ or a compound prevalence such as ‘alcohol or drug dependence’. Studies which reported only historical diagnoses or a ‘history of’ a wholly attributable alcohol condition were also excluded.

Data Extraction

Three authors (ER, RM and SE) independently extracted data from all eligible studies using a standardised data extraction spreadsheet and coding dictionary which can be found as figures S3 and S4 in the online supplementary material. In the case of incomplete reporting of data, we searched studies' online supplementary appendices, and contacted authors as necessary.

The main outcome extracted was prevalence of a wholly attributable alcohol condition. Other parameters which were deemed a priori to have the potential to contribute to variation in prevalence estimates were also extracted. These included: type of patient population, setting, type of diagnostic assessment and whether this was considered robust, mean age of sample, number of females, year of data collection and the constituent nation of the UK the study was conducted in. A complete list with descriptions can be found as figure S5 in the online supplementary material.

Some studies reported prevalence estimates in more than one sample of patients, or for more than one wholly attributable alcohol condition, these estimates were extracted separately. Where multiple studies reported on the same patient sample the more conservative estimate was used for meta-analysis.

Quality Assessment

The quality of each pooled prevalence estimate was assessed using the Grading of Recommendations Assessment, Development, and Evaluation (GRADE) framework. Each estimate is given a rating of *high*, *moderate*, *low* or *very low* quality based upon scores in five domains: risk of bias, inconsistency, indirectness, imprecision and other considerations. Due to the observational nature of the data the default quality score is *low* which can then be up- or down-graded according to the quality of the evidence for each estimate. Risk of bias was assessed using a quality assessment tool adapted from the Newcastle-Ottawa Scale (15), (see figure S6 in the online supplementary material). Three reviewers (ER, RM and SE) independently scored the quality of each study. Any discrepancy was resolved by discussion, and where agreement could not be reached a fourth author (CD) was consulted. A complete description of the GRADE quality scoring can be found as figure S7 in the online supplementary material.

Statistical Analysis

Individual prevalence estimates for each of the twenty-six conditions were stratified into four types of patient population (1) non-selective patients i.e. patients without any pre-specified characteristics who were sampled solely due to being in an inpatient setting, 2) patients with specific alcohol diagnoses, 3) patients with specific health disorders, and 4) patients within specific medical specialties. Within these groups prevalence estimates were pooled in meta-analysis if there were ≥ 2 estimates of the same condition in the same patient population grouping. All estimates from the non-selective patient population were pooled, and estimates from patients with the same alcohol specific diagnosis, the same health disorder, or from the same medical specialty were also pooled. Where only a single prevalence estimate was available within a particular patient population this was reported individually.

True prevalence was likely to vary between studies, due to a variety of factors including differences in study design and diagnostic definitions. As such a high degree of heterogeneity was anticipated, and we chose a priori to perform random effects meta-analysis (16). Prevalence as a measure is bounded by 0% and 100%, and some reported prevalence estimates may be close to these boundaries. As a normal approximation can break down at these extremes we used the Freeman-Tukey double arcsine transformation as a method of stabilising the variances (17).

Heterogeneity was examined through meta-regression if there were sufficient number of prevalence estimates (n ≥ 10) (18). Parameters were sequentially entered as univariate explanatory variables to assess their contribution to the variation in the prevalence estimates. Meta-regression was restricted a priori to estimates derived from samples in which the mean age of patients was ≥ 18 years of age, as this is the legal limit to purchase alcohol in the UK, and it was felt to include studies in which patients had a mean age < 18 would not lead to results that were clinically meaningful.

We compared τ^2 (the between-study variance), and I^2 values from the meta-analysis with the τ^2, and I^2 values, and the adjusted R^2 (the percentage of variation in the prevalence estimates explained by parameter) from each univariate meta-regression. Where explanatory variables were continuous or binary results were reported to show how the pooled prevalence estimate changes with each unit increase of the explanatory variable. For categorical variables results were reported to show how pooled prevalence estimates differ across categories. If there was a reduction in the τ^2 and I^2, and an $R^2 > 0$ for any individual explanatory variable on univariate meta-regression we planned to introduce these variables

using a forward approach into a multivariate meta-regression model, provided this would not breach the rules of data sparsity and result in overparameterisation (in this case defined as fewer than ten prevalence estimates for each covariate) of the model. All analyses were conducted in STATA IC version 15.

Role of the funding source:

This study was supported by the corresponding author's MRC Addiction Research Clinical (MARC) Fellowship. The funder had no role in study design; in the collection, analysis, or interpretation of data; in the writing of the report; or in the decision to submit the paper for publication. ER had full access to all the data in the study and all authors had final responsibility for the decision to submit for publication.

Results

The search generated 1524 unique results and 41 additional references were identified from citation searching leading to a total of 1565. We examined 357 full texts and included 124 studies. 233 studies were excluded; common reasons for exclusion included reporting in a non-inpatient sample (n=43), and reporting the prevalence of 'alcohol use' or alcohol 'problems' (n=72). Full reasons for each study's exclusion can be found as table S1 in the online supplementary material.

The 124 included studies consisted of 127 unique patient samples, and reported 171 individual prevalence estimates, in a total of 1,657,614 patients. The PRISMA diagram in figure two describes the study selection. Two studies were RCTs, 14 were cohort studies, and 188 were cross-sectional.

A description of all included study characteristics can be found in table S2 in the online supplementary material. No studies reported a prevalence of alcohol induced residual and late onset psychotic disorder (F10.7), accidental poisoning by and exposure to alcohol (X45), alcoholic fatty liver (K70.0), alcohol-induced pseudo-Cushing's syndrome (E24.4), degeneration of the nervous system due to alcohol (G31.2), alcoholic cardiomyopathy (I42.6) or foetal alcohol syndrome (Q86.0). 64/124 of the included studies offered no description as to how their reported wholly attributable alcohol condition was diagnosed. Of the 60 that did report a description, 51 were considered to have used robust diagnostic methods to ascertain the diagnosis.

Non-selective patients

Eighty-three prevalence estimates were available in non-selective patients. Pooled prevalence estimates and their GRADE quality rating stratified by setting can be found in table one.

Twenty-nine prevalence estimates were available for a diagnosis of harmful use of alcohol F10·1, 27 of which were considered to have used a robust diagnostic assessment; the overall pooled prevalence using all estimates was 19·76% (95%CI 15·61% - 24·25%). Twenty-three prevalence estimates were available for a diagnosis of alcohol dependence F10·2, 18 of which were considered to have used a robust diagnostic assessment; the overall pooled prevalence using all estimates was 10·25% (95%CI 7·06% - 13·96%). Both

estimates were deemed *very low* quality according to GRADE. Forest plots for these analyses can be found in figures three and four.

Forest plots for prevalence estimates for all other wholly attributable alcohol conditions and GRADE evidence profiles in non-selective patients can be found as figure S8 and table S3 in the online supplementary material.

Patients with a specific alcohol diagnosis, specific health disorders and within a specific medical specialty

Three prevalence estimates were available in patients with a specific alcohol diagnosis, and no prevalence estimates could be combined in meta-analysis.

Seventy-five prevalence estimates were available in patients with specific health disorders, and meta-analysis was possible for eight wholly specific alcohol diagnoses. Four estimates reported a prevalence of harmful use of alcohol in patients with self-harm (16.14%, 95%CI 3.07% - 36.54%), two estimates reported a prevalence of harmful use of alcohol in patients with self-poisoning (2.50%, 95%CI 1.01% - 4.54%), two estimates reported a prevalence of alcohol dependence in patients with serious mental illness (16.76%, 95% CI 13.10% - 20.76%), three estimates reported a prevalence of alcohol dependence in patients with self-harm (11.17% 95%CI 8.35% - 14.32%), two estimates reported a prevalence of alcoholic hepatitis in patients with decompensated cirrhosis (9.93%, 95% 7.67% - 12.44%), five estimates reported a prevalence of alcoholic cirrhosis in patients with decompensated cirrhosis (74.39%, 95%CI 52.82% - 91.16%), three estimates reported a prevalence of alcoholic liver disease, unspecified in patients with chronic liver disease (52.70%, 95%CI 29.55% - 75.25%), and seven estimates of alcohol-induced acute pancreatitis in patients with acute pancreatitis (23.55%, 95%CI 17.39% - 30.32%). All were deemed to be *very low* quality according to GRADE.

Eleven prevalence estimates were available in patients within a specific medical specialty, and meta-analysis was possible for two estimates which reported harmful use of alcohol in patients in high-security hospitals (7.19% 95% CI 6.03% - 8.43%). This was deemed to be *very low* quality according to GRADE

All prevalence estimates, their GRADE evidence profiles and forest plots can be found in tables S4 - S9 and figures S9 - S10 in the online supplementary material.

Meta-regression

Two pooled prevalence estimates contained data from ≥ 10 studies, these were harmful use of alcohol and of alcohol dependence in non-selective patients. Tables two and three show the complete results of the meta-regression.

When restricted to samples where the mean age of patients was > 18 years univariate meta-regression data from 13 prevalence estimates showed that mean age of patients explained 84·07% of the variation in the prevalence of harmful use, and data from 7 prevalence estimates showed that mean age of patients explained 100% of the variation in prevalence of alcohol dependence. Due to the low number of data points used to estimate these parameters, they should be interpreted with caution. There was strong evidence that for every one-year increase in mean age of patients the prevalence of harmful use of alcohol reduces by 0·81% (95% CI -1·19% to -0·44%, p=0·001), and strong evidence that for every one-year increase in mean age of patients the prevalence of alcohol dependence reduces by 0·80% (95% CI -1·36% to -0·24%, p<0·001). Bubble plots displaying the relationship between change in mean age and change in prevalence estimates can be found as figure S11 in the online supplementary material. The alcohol dependence model contained data from only 7 prevalence estimates and suffers from overparameterisation, accordingly this result should be interpreted with caution.

Univariate meta-regression data from 28 prevalence estimates showed that type of setting explained 79·26% of the variation in prevalence of harmful use, and data from 23 prevalence estimates showed that type of setting explained 60·84% of the variation in prevalence of alcohol dependence. Individual prevalence estimates for each different type of setting can be found in the forest plots in figures three and four. However, as setting is a categorical variable with four groups both models for harmful use of alcohol and alcohol dependence suffer from overparameterisation, and these results should be interpreted with caution.

It is notable that neither the year of data collection, whether the study reported a robust diagnostic assessment nor the constituent nation of the UK the study was conducted in appeared to substantially explain or contribute to the variation in prevalence estimates on meta-regression.

Due to data sparsity we were unable to combine any covariates in multivariate meta-regression. As there were ≥ 10 studies included for these pooled prevalence estimates

funnel plots were generated and can be seen as figure S12 in the online supplementary material.

Discussion

Approximately one in five inpatients in hospital in the UK is harmfully using alcohol and one in ten is alcohol dependent. Compared to the UK general population this is ten and eight times higher respectively (19). High levels of heterogeneity were observed, even within similar patient populations, and the data suggest the main sources of variation are a) different types of inpatient setting and b) mean age of patients.

Harmful use ranges from being most prevalent in mental health inpatient units to least prevalent in general wards. Alcohol dependence ranges from being most prevalent in A&E to least prevalent in general wards. We might have anticipated the prevalence to be higher in mental health inpatient units and A&E due to the high level of substance use comorbidity in patients with psychiatric illness, and those with injuries (20, 21). This appears to be supported by the data which, despite high I^2 values, demonstrates coherent patterns of prevalence estimates across each setting. It seems reasonable to conclude that setting plays an important role in the variation of the prevalence in hospital settings.

Mean patient age demonstrates strong evidence of a linear association with prevalence of both harmful use and alcohol dependence, after restriction to those samples with a mean age > 18 years old. This fits with what we may have expected a priori, however the strength of association is marked and mean age of patients may perhaps be more important in determining the overall in-hospital prevalence than is currently considered in clinical practice.

Little of the variation appears to be explained by year of data collection. Diagnostic criteria and case definitions for wholly attributable alcohol diagnoses have changed substantially over the time period covered in the review. Classification has changed with each iteration of the ICD (12), alongside societal and regulatory changes in what is considered a high risk level of drinking. Changes over time in coding practice may also have affected the accuracy of prevalence estimates. Throughout the UK, in-hospital diagnoses are coded according to the ICD-10 in a system known as ‘Hospital Episode Statistics’ (HES) (22). Over the time course studied in this review sequentially more diagnoses have been recorded for each patient per inpatient episode (e.g. in 2000 the number of coded diagnoses increased from 7 to 14, and in 2007 it increased again to 20). This has the potential over time to have underestimated prevalence due to the previous lack of space for alcohol attributable conditions to be recorded. However, when investigated through meta-regression year of data collection did not appear to substantially contribute to the variation in prevalence

estimates, nor was there a coherent pattern of the effect of time on visual inspection of the data.

It is also notable that little of the variation appears to be explained by gender, as in the UK general population estimates would suggest higher numbers of males meet criteria for harmfully use (19). This may potentially be explained by fewer males, or greater numbers of females seeking inpatient healthcare.

The study has several strengths and limitations. We implemented robust methods to conduct the review, using a broad search strategy, and a pre-defined protocol to capture studies of any design. However, prevalence estimates are not often the primary aim of a study, and as such were often buried within the main body of article texts, prevalence not specifically indexed as an outcome. This may have led to some studies being missed at the inclusion stage. We chose to limit included studies to those only reported in the English language, however, as this review was focussed on the UK it was deemed unlikely that studies would be reported in languages other than English.

A further caveat is that formal evaluation of the quality of all prevalence estimates was either *low*, or *very low* according to GRADE, resulting in little variation in estimates being explained by study quality. GRADE was however initially designed to focus on intervention studies, since its use has become more widespread there have been critiques regarding its application to observational data. A 2013 survey of public health researchers identified GRADE's limited applicability to diverse epidemiological study types a key drawback (23). It should be noted that the GRADE default position to begin the overall quality rating at *low* for observational data seemingly does not take into account that observational studies are the most appropriate study design to obtain prevalence estimates. Another drawback is the criteria requiring fulfilment in order to up-grade the quality rating do not easily translate when the outcome measure is a prevalence estimate. These criteria include a 'large magnitude of effect', demonstration of a 'dose-response gradient' or consideration of adequate control of confounding (24). Nevertheless, whilst we could have chosen to simply use the total Newcastle-Ottawa scale score as a quality measure, as has been done in other systematic reviews of prevalence data (25), GRADE provides a single overall quality rating per estimate having taken into account additional potential sources of bias including inconsistency and publication bias which are important in prevalence meta-analyses (18). As such GRADE was deemed the most appropriate method to assess quality measures despite the limitations outlined above,

Over half the studies did not report their method of diagnostic ascertainment, and those that did used different methods or screening instruments. Even those studies using the same screening instrument e.g. the Alcohol Use Disorders Identification Test (AUDIT) often either a different cut-off was used to diagnose certain disorders (e.g. AUDIT ≥15, ≥ 16 or ≥ 20 for alcohol dependence) (26) or ranges were not specified for cut-offs, leading to the potential for more severe alcohol disease such as dependence being misclassified as harmful use of alcohol (27). This may have the consequence of overestimating the prevalence of those less severe conditions, whilst underestimating the prevalence of more severe conditions. As such the finding that whether or not the study reported a robust diagnostic assessment appeared to substantially explain or contribute to the variation in prevalence estimates should be interpreted with caution, given the different diagnostic ascertainment methods used. With regards to the assessment of harmful use and alcohol dependence in non-selective patients over 75% of both diagnoses were considered to be robust. Meta-regression also demonstrated that whether the study reported a robust diagnostic assessment for the wholly attributable alcohol condition did not appear to substantially contribute to the variation in prevalence estimates.

Whilst alcohol is wholly causative for the conditions discussed in this review we acknowledge it is also a contributory factor to a plethora of other conditions. As such this study does not purport to be an exhaustive exploration of the burden of disease attributable to alcohol in the UK hospital system.

In 1982 McIntosh stated that it was “not possible to say, either precisely or even within what limits, what proportion of general hospital patients have alcohol-related disorders” (1). We hope this review goes someway to demonstrate this proportion within the inpatient population. Whilst clinicians may be aware that the prevalence of these conditions is ‘high’ in hospital settings, prevalence is often discussed in the literature without quantification (4). We have attempted to provide this quantification, and are of the opinion that our results, represent a much larger magnitude than is currently anecdotally assumed.

Our data support the fact that hospital clinicians should be skilled in the diagnosis and management of alcohol-related conditions given their ubiquity in this setting. Nevertheless, current rates of formal screening for alcohol-related conditions in hospital remain low (5). Given the fact that other chronic diseases with a lower in-hospital prevalence (e.g. diabetes), are both routinely screened for and often have dedicated in hospital specialist care teams, our study provides weight to advocate for increased routine universal screening, and, given the fact that hospital clinicians often report that they do not feel confident in the management

of alcohol use disorders (28), our study adds to the evidence to support improved training around alcohol-related conditions. Due consideration should be given to the need for dedicated inpatient specialist alcohol care teams to ensure the widespread problem is being addressed, particularly in the current context of diminishing numbers of specialist alcohol services in the UK.

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Tables

Table one: Pooled prevalence for wholly attributable alcohol conditions in non-selective patients in the UK hospital system stratified by setting

Non-selective patients		Prevalence % (95% CI)					
	Number of Prevalence Estimates (n)	Number of patients (n)	General medical or surgical ward	ICU	A&E	Mental health inpatient unit	Overall
Mental and behavioural disorders due to use of alcohol (F10·x)							
Alcohol Intoxication F10·0	5	81990	6·17 (4·41 - 8·19)	-	12·76 (0·44 - 37·87)	-	8·99 (0·58 -25·38)
Harmful use of alcohol F10·1	29	29533	16·10 (13·87 - 18·45)	17·07 (14·23 - 20·35)	24·23 (11·69 - 39·56)	36·21 (15·35 - 60·21)	19·76 (15·61 - 24·26)
Alcohol dependence F10·2	23	992784	6·21 (3·57 - 9·48)	17·41 (14·54 - 20·71)	16·01 (12·77 - 19·55)	14·63 (10·36 - 19·49)	10·25 (7·06 - 13·96)
Alcohol withdrawal state F10·3	3	48664	1·17 (0·03 - 3·47)	-	-	-	1·17 (0·03 - 3·47)
Alcohol withdrawal state with delirium F10·4	3	7100	1·66 (0·71 - 3·83)	-	0·06 (0·02 - 0·16)	0·00 (0·00 - 2·16)	0·28 (0·00 - 1·68)
Alcohol induced psychotic disorder F10·5	2	43726	-	-	-	0·04 (0·02 - 0·08)	0·04 (0·02 - 0·08)
Poisoning due to alcohol							
Intentional self-poisoning by and exposure to alcohol X65	1	12702	-	1·54 (1·34 - 1·76)	-	-	1·54 (1·34 - 1·76)*
Liver disorders due to alcohol (K70·x)							
Alcoholic hepatitis K70·1	1	104	0·96 (0·17 - 5·25)	-	-	-	0·96 (0·17 - 5·25)*
Alcoholic cirrhosis of liver K70·3	5	18249	0·66 (0·18 - 2·39)	2·38 (1·95 - 2·85)	-	-	2·23 (1·77 - 2·74)
Alcoholic hepatic failure K70·4	1	257081	0·22 (0·20 - 0·24)	-	-	-	0·22 (0·20 - 0·24)
Alcoholic liver disease, unspecified K70·9	5	644003	1·24 (1·19 - 1·29)	1·08 (1·05 - 1·12)	-	-	2·01 (1·52 - 2·56)
Gastrointestinal disorders due to alcohol							
Alcohol-induced acute pancreatitis K85·2	1	257081	0·41 (0·39 - 0·44)	-	-	-	0·41 (0·39 - 0·44)
Alcohol-induced chronic pancreatitis K86·0	1	257081	0·41 (0·39 - 0·44)	-	-	-	0·41 (0·39 - 0·44)
Alcoholic gastritis K29·2	1	257081	2·15 (2·09 - 2·20)	-	-	-	2·15 (2·09 - 2·20)
Other disorders due to alcohol							
Alcoholic polyneuropathy G62·1	1	301	1·00 (0·34 - 2·89)	-	-	-	1·00 (0·34 - 2·89)

All estimates were deemed *very low* quality according to GRADE unless marked by * which indicates *low* quality; CI=Confidence Interval; A&E=Accident and Emergency; ICU=In tensive Care Unit

Table two: Univariate meta-regression of study and patient characteristics on prevalence of harmful use of alcohol in non-selective patients in the UK hospital system

Harmful use of alcohol in non-selective patients	**Prevalence estimates (n)**	**Patients (n)**	**Prevalence**	**LCI**	**UCI**	**τ^2**	**I^2 (%)**		
	28	23529	20·47	17·39	23·73	0·04	96·99		
	Prevalence estimates (n)	**Patients (n)**	**Beta**	**LCI**	**UCI**	**τ^2**	**I^2 (%)**	**p value[1]**	**Adjusted R^2 (%)**
Is the study a conference abstract? (binary)	28	23529	-3·60	-16·82	9·62	0·008	82·64	0·58	0
Is the alcohol diagnosis diagnostic assessment robust? (binary)	28	23529	-10·38	-23·89	3·14	0·006	76·83	0·13	14·20
Mean age of patients (continuous)	13	5838	-0·81	-1·19	-0·44	0·001	42·49	0·001	84·07
Proportion female (continuous)	18	10925	-0·16	-0·44	0·12	0·011	84·18	0·25	2·51
Total Newcastle-Ottawa scale quality score (continuous)	28	23529	-0·02	-3·78	3·75	0·008	82·63	0·99	0
Year study conducted in (continuous)	19	17360	0·35	-1·94	2·64	0·006	77·99	0·75	0
Type of setting patients admitted to (categorical)	28	23529	-	-	-	0·002	52·59	<0·001	79·26
Nation study conducted in (categorical)	28	23529	-	-	-	0·008	80·58	0·46	0

1 - Result from t-test where the null hypothesis was no linear relationship between prevalence and each explanatory variable; LCI=Lower Confidence Interval; UCI=Upper Confidence Interval; $\tau 2$= Between study variance; Adjusted R2= Percentage of variation in prevalence explained by a particular covariate

Table three: Univariate meta-regression of study and patient characteristics on prevalence of alcohol dependence in non-selective patients in the UK hospital system

Alcohol dependence in non-selective patients	Prevalence estimates (n)	Patients (n)	Prevalence	LCI	UCI	τ^2	I^2 (%)		
	23	992784	10·25	7·06	13·96	0·070	99·75		
	Prevalence estimates (n)	**Patients (n)**	**Beta**	**LCI**	**UCI**	**τ^2**	**I^2 (%)**	**p value[1]**	**Adjusted R^2 (%)**
Is the study a conference abstract? (binary)	23	992784	-1·39	-11·80	9·03	0·004	96·21	0·79	0
Is the alcohol diagnosis diagnostic assessment robust? (binary)	23	993784	-1·09	-9·30	7·13	0·004	95·22	0·79	0
Mean age of patients (continuous)	7	7496	-0·80	-1·36	-0·24	0·000	0·00	0·02	100·00
Proportion female (continuous)	10	8588	0·03	-0·29	3·50	0·002	46·80	0·83	0
Total Newcastle-Ottawa scale quality score (continuous)	23	992784	0·31	-2·14	2·77	0·004	95·00	0·79	0
Year study conducted in (continuous)	16	986504	0·45	-1·10	2·01	0·004	94·59	0·54	0
Type of setting patients admitted to (categorical)	23	992784	-	-	-	0·001	64·09	0·009	60·84
Nation study conducted in (categorical)	23	992784	-	-	-	0·004	95·38	0·40	2·01

1 - Result from t-test where the null hypothesis was no linear relationship between prevalence and each explanatory variable; LCI=Lower Confidence Interval; UCI=Upper Confidence Interval; $\tau 2$= Between study variance; Adjusted R2= Percentage of variation in prevalence explained by a particular covariate

Figures

Figure one: The twenty-six wholly attributable alcohol diagnoses as coded in the International Classification of Diseases Diagnostic Criteria for Research Volume 10 (ICD-10 DCR) (12)

Figure two: PRISMA flow diagram describing study selection

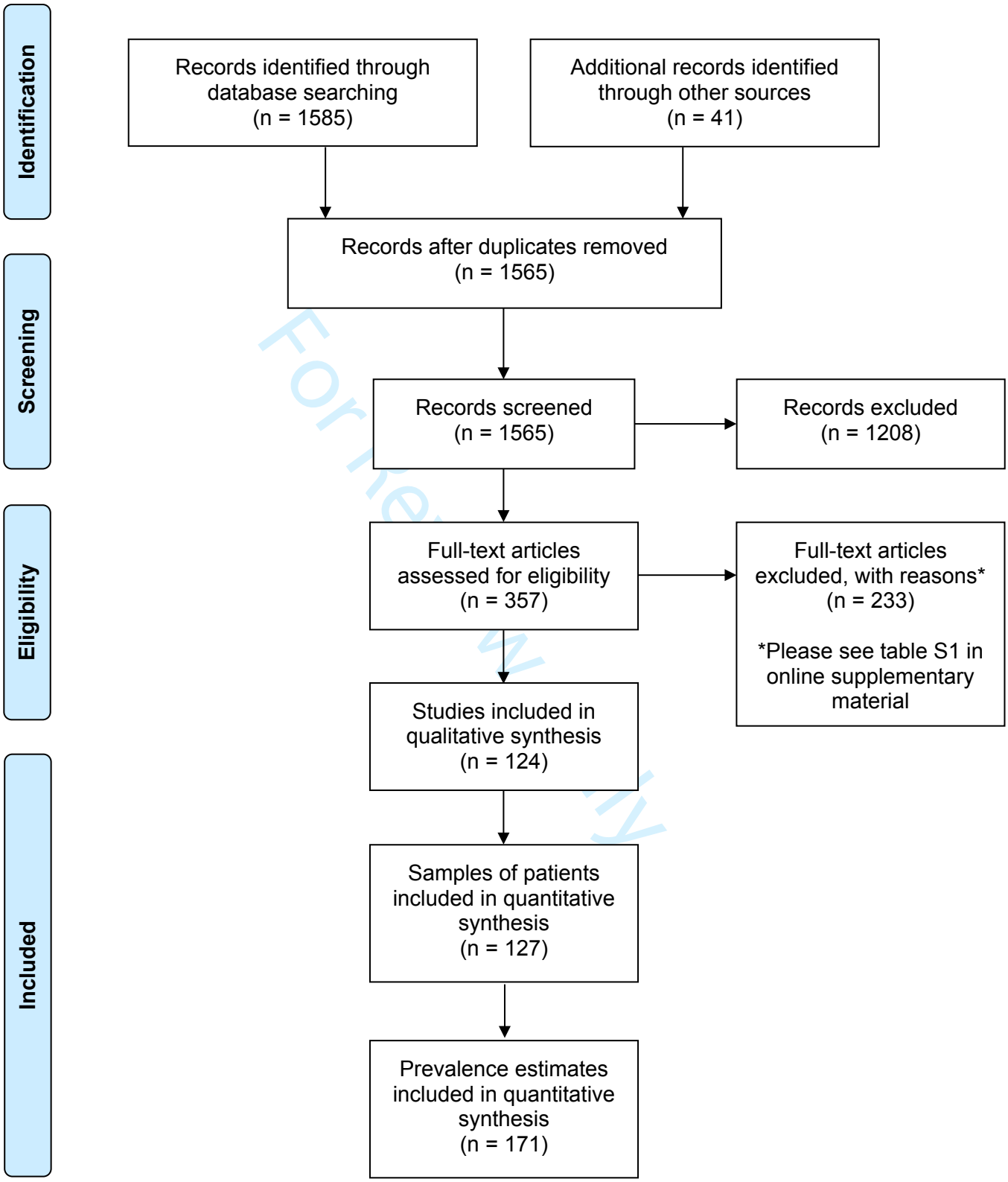


Figure three: Forest plot of the pooled prevalence for harmful use of alcohol in non-selective inpatients in the UK hospital system stratified by setting and ordered by the year in which the study was conducted

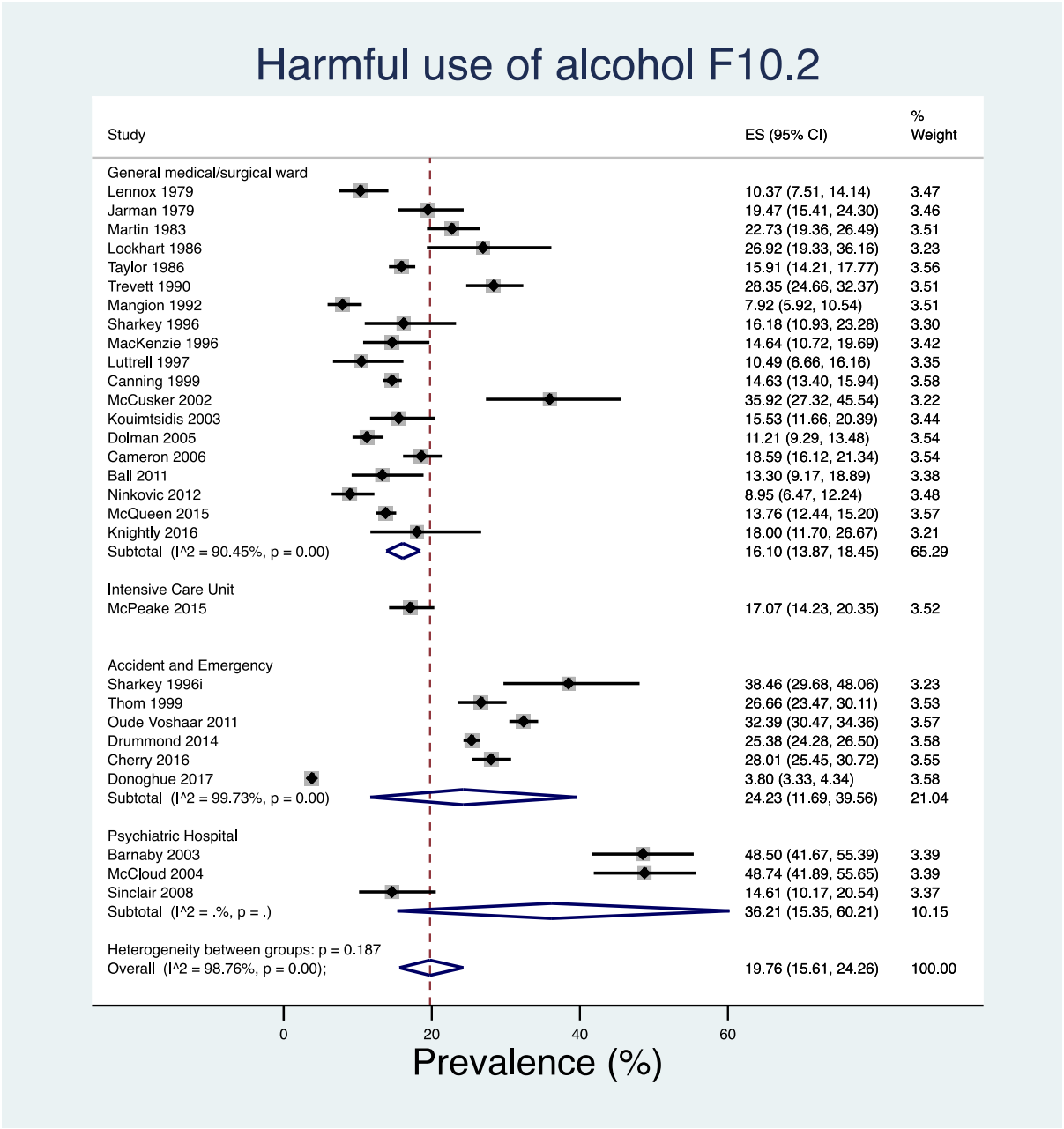
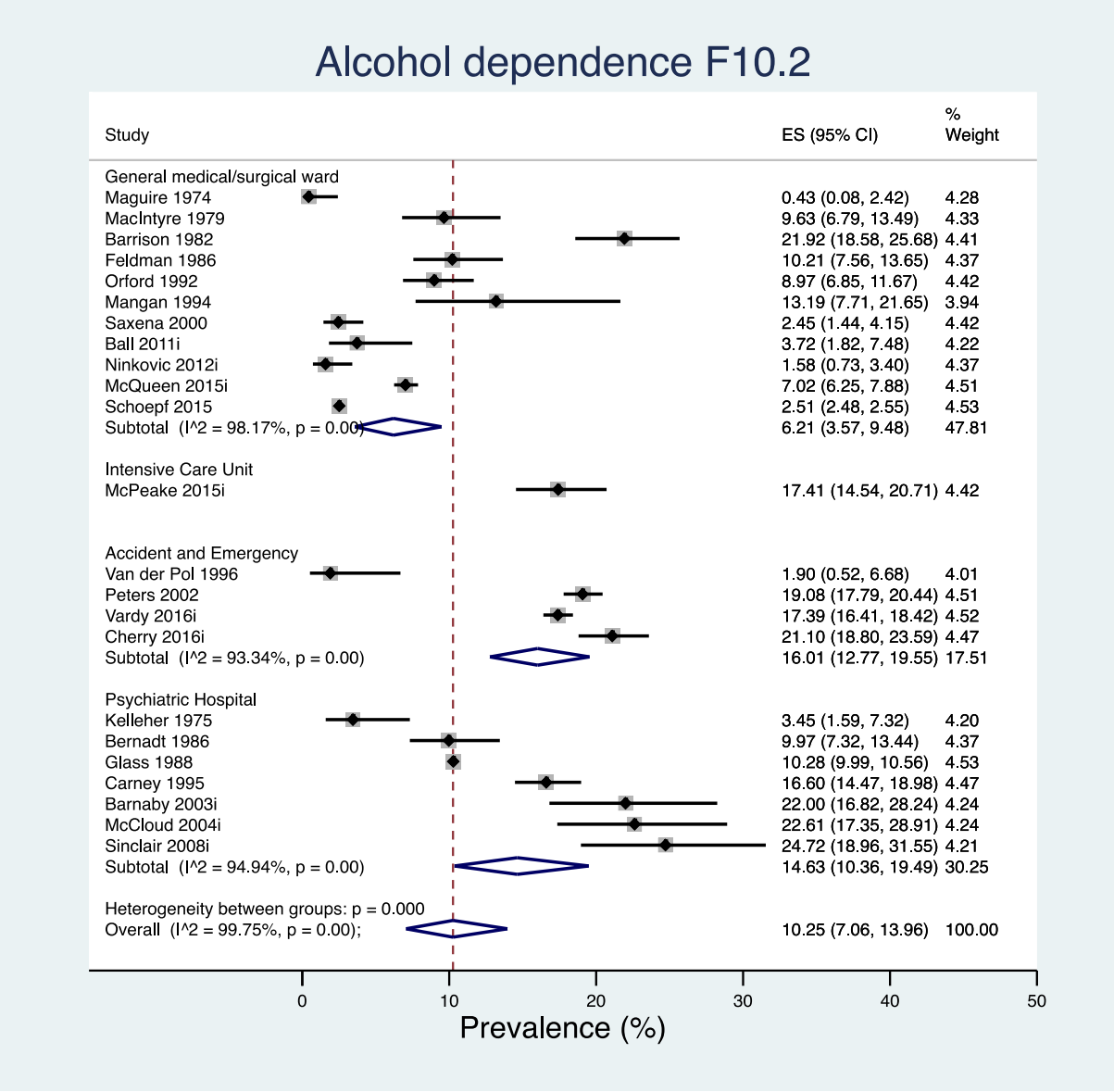


Figure four: Forest plot of the pooled prevalence for alcohol dependence in non-selective inpatients in the UK hospital system stratified by setting and ordered by the year in which the study was conducted



Online Supplementary Material

Figure S1:

Search strategy for Medline, Embase and PsychINFO using the Ovid interface

1. exp Alcohol Drinking/
2. exp Alcohol-Related Disorders/
3. (alcohol* or ethanol or EtOH).af
4. 1 or 2 or 3
5. (inpatient* or in-patient* or ward or admit* or admis*).af
6. (England or Wales or Ireland or Scotland or UK or United Kingdom or Britain).af
7. (prevalence* or epidemiol* or cohort or cross sectional or cross-sectional or survey).af
8. (randomi!ed and control* and trial).af
9. 7 or 8
10. 4 and 5 and 6 and 9

Search strategy for the Cochrane Central Register of Controlled Trials (CENTRAL)

#1 MeSH descriptor Alcohol Drinking explode all trees
#2 MeSH descriptor Alcohol-Related Disorders explode all trees
#3 (alcohol* or ethanol or EtOH):ti,ab,kw
#4 (#1 or #2 or #3)
#5 (inpatient* or in-patient* or ward or admit* or admis*):ti,ab,kw
#6 (England or Wales or Ireland or Scotland or UK or United Kingdom or Britain):ti,ab,kw
#7 (#4 and #5 and #6)

It is possible to use an 'explosion' facility within a database using the command 'exp'. This makes use of a hierarchicsal thesaurus and 'explode' a high level term to search for many terms at once. The 'exploded' Alcohol Related Disorders term includes the second order terms: Alcohol-Induced Disorders [C25.775.100.087], Alcoholic Intoxication [C25.775.100.175], Alcoholism [C25.775.100.250], Binge Drinking [C25.775.100.437] and Wernicke Encephalopathy [C25.775.100.625]

Figure S2: Study Protocol

Population	Anyone receiving current treatment in an inpatient facility specified below: General medical or surgical ward inpatients, General hospital intensive care unit (ICU) inpatients, Accident and emergency (A&E) patients or psychiatric hospital inpatients
Outcome	A reported prevalence (or calculable prevalence) description of an ICD10-DCR wholly attributable alcohol diagnosis: Alcohol Intoxication F10.0, Harmful Use of Alcohol F10.1, Alcohol Dependence F10.2, Alcohol Withdrawal State F10.3, Alcohol Withdrawal State with Delirium F10.4, Alcohol induced Psychotic Disorder F10.5, Alcohol induced Amnestic Disorder F10.6, Alcohol induced Residual and Late Onset Psychotic Disorder F10.7, Accidental poisoning by and exposure to alcohol X45, Intentional self-poisoning by and exposure to alcohol X65, Poisoning by and exposure to alcohol, undetermined intent Y15, Alcoholic Fatty Liver K70.0, Alcoholic Hepatitis K70.1, Alcoholic Fibrosis and Sclerosis of Liver K70.2, Alcoholic Cirrhosis of Liver K70.3, Alcoholic Hepatic Failure K70.4, Alcoholic Liver Disease, Unspecified K70.9, Alcohol-induced pseudo-Cushing's syndrome E24.4, Degeneration of nervous system due to alcohol G31.2, Alcoholic polyneuropathy G62.1, Alcoholic myopathy G72.1, Alcoholic cardiomyopathy I42.6, Alcoholic gastritis K29.2, Alcohol-induced acute pancreatitis K85.2, Alcohol-induced chronic pancreatitis K86.0, Fetal alcohol syndrome (dysmorphic) Q86.0

Extracted Variables	- The type of patient population under study. This was defined a priori as either:
	  o A non-selective/consecutive population of patients, (i.e. patients without any pre-specified characteristics whom were sampled only due to their being in an inpatient setting),
	  o A population of patients with a specific alcohol diagnosis (e.g. patients with alcohol dependence),
	  o A population of patients with a specific health disorders (e.g. patients with a lower respiratory tract infection or self-harm), or
	  o A population of patients within a specific medical specialty (e.g. patients on a gastroenterology ward)
	- Whether the study was a conference abstract
	- The diagnostic tool or method used to establish the wholly attributable alcohol condition, and whether it was considered robust diagnostic measure (Robust was defined as using wither the ICD, DSM or a validate screening questionnaire including but not limited to the AUDIT, CAGE, and MAST)
	- The mean age of the sample
	- The percentage of females in the sample
	- Whether or not the wholly attributable alcohol condition was causal or incidental to the inpatient admission. The relationship was classified as causal where this was specifically stated or where it could reasonably be inferred. In some cases there was insufficient evidence to be able to make a clear judgment as to the causal or incidental nature
	- The year of data collection. This was divided into five-year time bands from 1960 until the present day. For those studies which spanned two or more time-bands the time-band corresponding to the largest proportion of the period over which data was collected was ascribed
	- The setting in which the patient was seen. This was defined a priori as either a:
	  o General medical or surgical ward
	  o ICU
	  o A&E
	  o Mental health inpatient units
	- The constituent nation of the United Kingdom the study was conducted in

Exclusions	Studies which report the prevalence of: “alcohol use”, “alcohol-related problems”, “alcohol-related disease”, “risky drinking”, “heavy alcohol intake”, “alcohol excess”; Studies which report a compound prevalence measure including: “Alcohol or drug dependence”, “Alcohol abuse or dependence”; Studies which report inpatients in a specific addiction detoxification or rehabilitation unit; Studies which report historical not current diagnoses; Studies which report methanol poisoning (T51.1)
Study Design	Any study design
Quality Assessment	Newcastle-Ottawa Checklist GRADE

Figure S3: Data Coding Sheet

Variable: Study ID (String)

Free text study name and year e.g. Kirkham 1988

Variable: Conference Abstract? (Numeric)

No=0

Yes=1

Variable: Alcohol Diagnosis ICD 10 DCR (Numeric)

Alcohol Intoxication F10.0=1

Harmful Use of Alcohol F10.1=2

Alcohol Dependence F10.2=3

Alcohol Withdrawal State F10.3=4

Alcohol Withdrawal State with Delirium F10.4=5

Alcohol induced Psychotic Disorder F10.5=6

Alcohol induced Amnestic Disorder F10.6=7

Alcohol induced Residual and Late Onset Psychotic Disorder F10.7=8

Accidental poisoning by and exposure to alcohol X45=9

Intentional self-poisoning by and exposure to alcohol X65=10

Poisoning by and exposure to alcohol, undetermined intent Y15=11

Alcoholic Fatty Liver K70.0=12

Alcoholic Hepatitis K70.1=13

Alcoholic Fibrosis and Sclerosis of Liver K70.2=14

Alcoholic Cirrhosis of Liver K70.3=15

Alcoholic Hepatic Failure K70.4=16

Alcoholic Liver Disease, Unspecified K70.9=17

Alcohol-induced pseudo-Cushing's syndrome E24.4=18

Degeneration of nervous system due to alcohol G31.2=19

Alcoholic polyneuropathy G62.1=20

Alcoholic myopathy G72.1=21

Alcoholic cardiomyopathy I42.6=22

Alcoholic gastritis K29.2=23

Alcohol-induced acute pancreatitis K85.2=24

Alcohol-induced chronic pancreatitis K86.0=25
Fetal alcohol syndrome (dysmorphic) Q86.0=26

Missing/Not Reported =.

Notes:
Exclude: Methanol poisoning T51.1

Variable: Alcohol Diagnosis Diagnostic Assessment (String)
Free text description of method used
NR=.

Variable: Acceptability of Alcohol Diagnosis Diagnostic Assessment - Adequate to fulfil ICD-10 Criteria (Numeric)
Unacceptable=0
Acceptable=1

Variable: Cohort (Numeric)
Non-selective/Consecutive=1
Alcohol-specific diagnosis cohort=2
Disease-specific cohort=3
Specialty-specific cohort=4
Missing/Not Reported=.

Variable: Cohort Description (String)
Brief free text description of patients in cohort

Variable: Setting (Numeric)
General hospital ward inpatients=1
General hospital intensive care unit (ICU) inpatients=2
Accident and emergency inpatients=3
Psychiatric hospital inpatients=4
Missing/Not Reported=.

Variable: Alcohol diagnosis causal or incidental to admission: (Numeric)
Causal=1
Incidental=2

Unclear=3

Variable: Year of data collection (Numeric)

<1960=1

Jan 1st 1960 - 31st Dec 1964=2

Jan 1st 1965 - 31st Dec 1969=3

Jan 1st 1970 - 31st Dec 1974=4

Jan 1st 1975 - 31st Dec 1979=5

Jan 1st 1980 - 31st Dec 1984=6

Jan 1st 1985 - 31st Dec 1989=7

Jan 1st 1990 - 31st Dec 1994=8

Jan 1st 1995 - 31st Dec 1999=9

Jan 1st 2000 - 31st Dec 2004=10

Jan 1st 2005 - 31st Dec 2009=11

Jan 1st 2010 - 31st Dec 2014=12

Jan 1st 2015 - Present =13

Missing/Not reported=.

Variable: Country (Numeric)

England=1

Scotland=2

Wales=3

Northern Ireland=4

United Kingdom (constituent Nation prevalence not reported) =5

Missing/Not reported=.

Variable: Mean Age (Numeric)

Mean Age=

Missing/Not Reported=.

Variable: Percentage Female (Numeric)

Percentage Female=

Missing/Not Reported=.

Variable: Cases (Numeric)

Number of cases of alcohol specific diagnosis=

Variable: Denominator (Numeric)

Total number of inpatients studied=

Variable: Notes (String)

Additional Notes

Quality Assessment Variables

Variable: Representativeness (Numeric)

Range=0-2

a. Truly representative of the average in the target population (random sample or whole population) (Two points)

b. Somewhat representative of the average in the target population (purposive sampling of specific wards or specialties) (One point)

c. Selected group of users (specific disease) (No points)

d. No description of the derivation of the cohort (No points)

(Two points for A; One point for B; Zero points for C or D)

Variable: Non-participants (Numeric)

Range=0-1

a. Comparability between participants and eligible non-participants is established, and the participation rate is satisfactory (>60%) (One point)

b. The participation rate is unsatisfactory, or the comparability between participants and eligible non-participants is unsatisfactory (No points)

c. No description of the response rate or the characteristics of the responders and non-responders (No points)

(One point for A; Zero points for B or C)

Variable: Sample Size (Numeric)

Range: 0-1

a) Justified and satisfactory. (>100)

b) Not justified or satisfactory (99)

(One point for A; Zero points for B)

Variable: Comparability (Numeric)

Range=0-2

The subjects are comparable across studies based on age and gender, based on the study design or analysis.
a) Comparable (Two points)
b) Non-Comparable (No points)
(Two points for A; Zero points for B)

Variable: Ascertainment of the diagnosis of specific ICD-10 wholly attributable alcohol diagnosis (Numeric)
Range=0-2
a. Established ICD-10 diagnostic code reported (Two points)
b. Appropriate validated measure used to ascertain diagnosis (One point)
c. Non-validated measure used or no description of how alcohol related diagnosis ascertained (No points)
(Two points for A; One point for B; Zero points for C)

Variable: Prevalence Measurement (Numeric)
Range=0-1
a. The study reports results that enable calculation of a prevalence numerator and denominator (No points)
b. The study does not report results that enable calculation of a prevalence numerator and denominator (No points)
(One point for A; Zero points for B)

Variable Total Quality Score (Numeric)
Range=1-9 (9 indicating highest quality)

Figure S4: Data Extraction Spreadsheet

Study ID	Extra Diagnoses	CA?	Alcohol Diagnosis	Alcohol Diagnosis Diagnostic Assessment	ADA Appropriate?	Patient Cohort Type	Cohort Description	Ward Setting	Causal/Incidental?	Year	Reported Year	Country	Mean Age	% Female	Numerator	Denominator

Q: Representativness	Q: Non-participants	Q: Sample Size	Q: Comparability	Q: Alcohol Diagnosis	Q: Prevalence Measurment	Q: Total	Reviewer	Notes

Figure S5: Extracted Parameters

- The type of patient population under study. This was defined a priori as either:
    - A non-selective/consecutive population of patients (i.e. patients without any pre-specified characteristics whom were sampled only due to their being in an inpatient setting),
    - A population of patients with a specific alcohol diagnosis (e.g. patients with alcohol dependence in an inpatient setting),
    - A population of patients with a specific disease, which are not explicitly alcohol related (e.g. patients with a lower respiratory tract infection in an inpatient setting), or
    - A population of patients within a specific medical speciality (e.g. patients on a gastroenterology ward)
- Whether the study was a conference abstract
- The diagnostic tool or method used to establish the wholly attributable alcohol condition, and whether that tool or method was considered a valid and appropriate diagnostic measure
- The mean age of the patient cohort
- The percentage of females in the patient cohort
- Whether or not the wholly attributable alcohol diagnosis was causal or incidental to the inpatient admission. The relationship was classified as causal where this was specifically stated or where it could reasonably be inferred from reporting. In some cases there was insufficient evidence to be able to make a clear judgment as to the causal or incidental nature in relation to the inpatient admission
- The year of data collection. This was divided into five-year time bands from 1960 until the present day. For those studies which spanned two or more time-bands the time-band corresponding to the largest proportion of the period over which data was collected was ascribed
- The setting in which the patient was seen. This was defined a priori as either:
    - Any inpatient medical or surgical ward

- Any intensive care or critical care unit (ICU)
- Any accident and emergency (A&E) department
- Any psychiatric hospital

- The constituent nation of the United Kingdom the study was conducted in

Figure S6: Adapted Newcastle-Ottawa Checklist

Adapted Newcastle-Ottawa Quality Assessment Scale

Selection (Maximum four points)

1. Representativeness of the cohort
   a. Truly representative of the average in the target population (random sample or whole population) (*Two points*)
   b. Somewhat representative of the average in the target population (purposive sampling of specific wards or specialties) (*One point*)
   c. Selected group of users (specific disease) (*No points*)
   d. No description of the derivation of the cohort (*No points*)

2. Non-participants
   a. Comparability between participants and eligible non-participants is established, and the participation rate is satisfactory (>60%) (*One point*)
   b. The participation rate is unsatisfactory, or the comparability between participants and eligible non-participants is unsatisfactory (*No points*)
   c. No description of the response rate or the characteristics of the responders and non-responders (*No points*)

3. Sample Size
   a. Justified and satisfactory (>100) (*One point*)
   b. Not justified or satisfactory (≤ 99) (*No points*)

Comparability (Maximum two points)

1. The subjects are comparable across studies based on age and gender and ethnicity, based on the study design or analysis
   a. Comparable (*Two points*)
   b. Non-Comparable (*No points*)

Outcome (Maximum three points)

1. Ascertainment of the diagnosis of specific ICD-10 wholly attributable alcohol diagnosis
   a. Established ICD-10 diagnostic code reported (*Two points*)
   b. Appropriate validated measure used to ascertain diagnosis (*One point*)
   c. Non-validated measure used or no description of how alcohol related diagnosis ascertained (*No points*)

2. Prevalence Measurement (0-1)
   a. The study reports results that enable calculation of a prevalence numerator and denominator (*No points*)
   b. The study does not report results that enable calculation of a prevalence numerator and denominator (*No points*)

Maximum Score 9

Figure S7: GRADE Quality Assessment

Risk of Bias: Risk of bias was assessed using a quality assessment tool adapted from the Newcastle-Ottawa Scale. The maximum available score was nine, higher scores indicating higher quality. There was deemed to be minimal risk of bias, and thus the overall quality rating was not downgraded, if the pooled average total quality score was ≥ 7. The overall quality rating was downgraded by one level (e.g. a reduction from *low* to *very low*) if the weighted average total quality score per estimate was 4-6, and the overall quality rating was downgraded by two levels if the weighted average total quality score per estimate was ≤ 3.

Inconsistency: Inconsistency refers to the level of heterogeneity between prevalence estimates, and was assessed using the I^2 statistic. The overall quality rating was not downgraded if I^2 was < 50%, was downgraded by one level if I^2 was ≥ 50% and < 75%, and by two levels if I^2 was ≥ 75%.

Indirectness: Indirectness refers to the extent to which the study population or outcome differ from those specified in the inclusion criteria. As all studies fulfilled the inclusion criteria no estimate was downgraded due to indirectness.

Imprecision: Imprecision refers to the extent to which we are uncertain about the estimates, and based on examination of the confidence interval (CI). As no guidelines exist as to what represents an appropriate precision of a prevalence, the following criteria were developed: the overall quality rating was not downgraded if the precision (i.e. half the CI) was < 5%, was downgraded by one level if the precision was ≥ 5 % and < 10%, and by two levels if the precision was ≥ 10%.

Other considerations: GRADE also considers other potential sources of bias, and publication bias was assessed within this domain. Consistent with the Cochrane handbook,(1) in cases where ≥ 10 studies were included in the meta-analysis funnel plots were produced. These were visually inspected to explore the possibility of preferential publication of small studies reporting inflated prevalence estimates, and in addition we performed Egger's test for small study effects.(2) Where evidence was suggestive of publication bias the overall quality rating was downgraded by one level.

Table S1: Excluded Studies

Abou-Saleh, M. T., et al. (2008). "The prevalence of substance misuse and emotional and behavioral problems in adolescents admitted to pediatric wards and those attending the antenatal clinic." Addictive Disorders & Their Treatment **7**(1): 25-30.	Exclude: Reports 'alcohol use'
Adams, R. H. (1986). "An accident and emergency department's view of self-poisoning: a retrospective study from the United Norwich Hospitals 1978-1982." Human Toxicology **5**(1): 5-10.	Exclude: Does not report calculable prevalence of alcohol self-poisoning
Agarwal, M. and K. Gaskell (1996). "Clinical features of alcoholic suicide attempters/non-attempters." Psychiatric Bulletin **20**(11): 656-659.	Exclude: Specific Alcohol Detoxification Unit Patients
Andoh, B. (1999). "Selected characteristics of absconders and non-absconders from mental hospitals: a comparison." The International journal of social psychiatry **45**(2): 117-124.	Exclude: People with a 'history of alcohol abuse' not current diagnosis
Anwar, M. U., et al. (2005). "Smoking, substance abuse, psychiatric history, and burns: trends in adult patients." Journal of Burn Care & Rehabilitation **26**(6): 493-501.	Exclude: Does not report calculable prevalence of alcoholism
Aspinall, R. J., et al. (2011). "Rapid identification, triage and management of alcohol related hospital admissions." Gut **2)**: A12-A13.	Exclude: Reports number of patients referred to an alcohol service. No denominator reported.
Azorin, J.-M., et al. (2013). "Mixed states with predominant manic or depressive symptoms: Baseline characteristics and 24-month outcomes of the EMBLEM cohort." Journal of Affective Disorders **146**(3): 369-377.	Exclude: Reports non calculable prevalence in multiple counties and mixed outpatient and inpatient sample
Ballinger, B. R. (1974). "Self-medication in psychiatric patients." International Journal of Social Psychiatry **20**(3-4): 180-185.	Exclude: Reports compound outcomes of personality disorder or alcoholism
Barrison, I. G., et al. (1982). "Detecting excessive drinking among admissions to a general hospital." Health Trends **14**(3): 80-83.	Exclude: Duplicate Abstract of Barrison 1982
Barrow, A., et al. (2012). "Late presentations of minor head injury." Emergency Medicine Journal **29**(12): 983-988.	Exclude: Reports alcohol intoxication at time of injury not whilst in A+ E
Barrowclough, C., et al. (2010). "Integrated motivational interviewing and cognitive behavioural therapy for people with psychosis and comorbid substance misuse: randomised controlled trial." BMJ (Clinical research ed.) **341 (no pagination)**(c6325).	Exclude: Unclear if inpatient cohort
Barry, E., et al. (2015). "Ethnic group variations in alcohol-related hospital admissions in England: does place matter?" Ethnicity & Health **20**(6): 557-563.	Exclude: Reports alcohol-related number admissions no calculable prevalence of alcohol specific condition in cohort
Beattie, J. O., et al. (1986). "Children intoxicated by alcohol in Nottingham and Glasgow, 1973-84." British medical journal (Clinical research ed.) **292**(6519): 519-521.	Exclude: No Denominator reported unable to calculate prevalence of alcohol poisoning
Bennett, S. P. H., et al. (2009). "Inhalation injury associated with smoking, alcohol and drug abuse: an increasing problem." Burns : journal of the International Society for Burn Injuries **35**(6): 882-887.	Exclude: Reports "smoking, alcohol or drug use" prevalence
Bennewith, O., et al. (2005). "Factors associated with the non-assessment of self-harm patients attending an Accident and Emergency Department: results of a national study." Journal of Affective Disorders **89**(1-3): 91-97.	Exclude: Reports "Illegal drugs/alcohol' prevalence
Bergen, H., et al. (2010). "Epidemiology and trends in non-fatal self-harm in three centres in England: 2000-2007." British Journal of Psychiatry **197**(6): 493-498.	Exclude: Reports 'alcohol involvement'

Bergen, H., et al. (2012). "Premature death after self-harm: A multicentre cohort study." The Lancet **380**(9853): 1568-1574.	Exclude Reports Prevalence of 'Alcohol problems'
Bewley, T. H. and O. Ben-Arie (1968). "Morbidity and mortality from heroin dependence. 2. Study of 100 consecutive inpatients." British Medical Journal **1**(5594): 727-730.	Exclude: Reports prevalence of excessive heavy drinkers
Bhala, N., et al. (2016). "Ethnic Variations in Liver- and Alcohol-Related Disease Hospitalisations and Mortality: The Scottish Health and Ethnicity Linkage Study." Alcohol and alcoholism (Oxford, Oxfordshire) **51**(5): 593-601.	Exclude: Reports rates of first hospitalisations due to alcohol attributable disease
Blad, W., et al. (2016). "Alcohol-related admissions to a central London hospital: Too little coding; Too much resource." Gut **65 (Supplement 1)**: A212-A213.	Exclude: Reports number of harmful drinkers admitted to A+ E; No denominator reported
Blenkiron, P., et al. (2000). "The timing of acts of deliberate self-harm: is there any relation with suicidal intent, mental disorder or psychiatric management?" Journal of Psychosomatic Research **49**(1): 3-6.	Exclude: Reports alcohol use at time of assessment
Bourke, J. B. (1975). "Variation in annual incidence of primary acute pancreatitis in Nottingham, 1969-74." Lancet (London, England) **2**(7942): 967-969.	Exclude: Duplicate data of Giggs 1998
Bowden, B., et al. (2018). "Risk of suicide following an alcohol-related emergency hospital admission: An electronic cohort study of 2.8 million people." PLoS ONE [Electronic Resource] **13**(4): e0194772.	Exclude: Reports frequency and incidence rates of death from suicide by alcohol admission codes.
Bristow, M. and A. Clare (1992). "Prevalence and characteristics of at-risk drinkers among elderly acute medical in-patients." British Journal of Addiction **87**(2): 291-294.	Exclude: Reports prevalence of 'at risk drinkers'
Bruce, M., et al. (2012). "Ethnic differences in reported unmet needs among male inpatients with severe mental illness." Journal of Psychiatric and Mental Health Nursing **19**(9): 830-838.	Exclude: Duplicate data from Bruce 2014
Burke, A. W. (1976). "Attempted suicide among Asian immigrants in Birmingham." British Journal of Psychiatry **128**: 528-533.	Exclude: No prevalence of alcohol related specific diagnosis reported
Burke, A. W. (1978). "Attempted suicide among Commonwealth immigrants in Birmingham." The International journal of social psychiatry **24**(1): 7-11.	Exclude: Reports Drug or Alcohol Addiction
Busby, J., et al. (2017). "How do population, general practice and hospital factors influence ambulatory care sensitive admissions: a cross sectional study." BMC Family Practice **18**(1): 67.	Exclude: Reports Alcohol Related Diseases prevalence
Camidge, D. R., et al. (2003). "The epidemiology of self-poisoning in the UK." British Journal of Clinical Pharmacology **56**(6): 613-619.	Exclude: Reports alcohol or substance dependency no calculable prevalence of an inpatient cohort
Cappai, A., et al. (2017). "Substance misuse in personality disorder and schizophrenia: Findings and clinical implications from a high secure hospital." Journal of Forensic Practice **19**(3): 217-226.	Exclude: Reports historical harmful alcohol use and dependency not current diagnoses
Carrà, G. and S. Johnson (2009). "Variations in rates of comorbid substance use in psychosis between mental health settings and geographical areas in the UK. A systematic review." Social Psychiatry and Psychiatric Epidemiology **44**(6): 429-447.	Exclude: Systematic review. All references checked for includable studies
Chakrabarti, S., et al. (2013). "Dipeptidyl peptidase-4 inhibitors and glucagon-like peptide 1 agonists are not linked with severe hypoglycaemia: An emergency department perspective." Diabetic Medicine **1)**: 148-149.	Exclude: Alcohol excess reported
Charlesworth, A., et al. (2015). "Acute pancreatitis associated with severe hypertriglyceridaemia; A	Exclude: Reports that alcohol excess could have been causative for some patients, but doesn't report acute pancreatitis by aetiology

retrospective cohort study." International journal of surgery (London, England) **23**: 23-27.	
Charzynska, K., et al. (2011). "Comorbidity patterns in dual diagnosis across seven European sites." The European Journal of Psychiatry **25**(4): 179-191.	Exclude: No separate UK results reported
Cheng, C., et al. (2017). "Alcohol-Related Dementia: A Systemic Review of Epidemiological Studies." Psychosomatics **58**(4): 331-342.	Exclude: Non inpatient UK sample prevalences reported
Cherpitel, C. J. (1994). "Alcohol and injuries resulting from violence: a review of emergency room studies." Addiction (Abingdon, England) **89**(2): 157-165.	Exclude: Reports positive Blood Alcohol Concentration 'BAC' in violent injuries prevalence not specific alcohol disease specific prevalence
Chick, J. (1991). "Early intervention for hazardous drinking in the general hospital." Alcohol & Alcoholism. Supplement **1**: 477-479.	Exclude: Review article, all references checked for additional includes
Chick, J. (1991). "Early intervention for hazardous drinking in the general hospital." Alcohol & Alcoholism. Supplement **1**: 477-479.	Exclude: No library or journal able to source full text, unclear from abstract if prevalence of alcohol specific diagnosis reported
Cobain, K., et al. (2011). "Brief interventions in dependent drinkers: a comparative prospective analysis in two hospitals." Alcohol & Alcoholism **46**(4): 434-440.	Exclude: Problem drinkers recruited into study. No calculable prevalence reported
Cochrane, R. (1977). "Mental illness in immigrants to England and Wales: an analysis of mental hospital admissions, 1971." Social Psychiatry **12**(1): 25-35.	Exclude: No UK specific figures reported; "Alcohol-problems" reported
Cochrane, R. (1980). "Mental illness in England, in Scotland and in Scots living in England." Social Psychiatry **15**(1): 9-15.	Exclude: Reports Alcoholism accounts for 30.6% of all male Scottish migrant's admissions to hospital in England, no denominator reported
Cochrane, R. and S. S. Bal (1989). "Mental hospital admission rates of immigrants to England: a comparison of 1971 and 1981." Social Psychiatry and Psychiatric Epidemiology **24**(1): 2-11.	Exclude: Reports rates of mental hospital admissions in England per 100,000 population, alcohol category is compound of alcohol abuse, dependence, psychosis and non-dependent abuse
Compton, S. A. and O. Daly (1986). "Rates of admission to six Northern Ireland psychiatric hospitals of patients with primary alcohol-related diagnoses." The Ulster medical journal **55**(2): 154-159.	Exclude: Reports change in % of alcohol related admissions
Cooper, J., et al. (2005). "Suicide after deliberate self-harm: A 4-year cohort study." American Journal of Psychiatry **162**(2): 297-303.	Exclude: Reports only subjects who died with alcohol misuse
Coppen, A., et al. (1983). "Dexamethasone suppression test in depression and other psychiatric illness." The British Journal of Psychiatry **142**: 498-504.	Exclude: Reported on cohort is rehabilitation unit inpatients with alcohol misuse
Corrigan, G. V., et al. (1986). "Alcohol dependence among general medical inpatients." British Journal of Addiction **81**(2): 237-245.	Exclude: Study conducted in the Republic of Ireland
Craig, D. G., et al. (2012). "Staggered overdose pattern and delay to hospital presentation are associated with adverse outcomes following paracetamol-induced hepatotoxicity." British Journal of Clinical Pharmacology **73**(2): 285-294.	Exclude: Duplicate Cohort
Currie, C., et al. (2016). "The impact of alcohol care teams on emergency secondary care use following a diagnosis of alcoholic liver disease - a national cohort study." BMC Public Health **16**: 685.	Exclude: No alcohol specific diagnosis prevalence calculable. No denominator reported, uses a HES extract of alcoholic liver disease from both inpatient and outpatient set.
Da Cruz, D., et al. (2011). "Emergency department contact prior to suicide in mental health patients." Emergency Medicine Journal **28**(6): 467-471.	Exclude: Does not report an in hospital prevalence. Individuals are a hypothetical cohort of patients attending ED who subsequently died by suicide
Daly, A. and D. Walsh (2010). "Psychiatric disorder treated in acute general hospitals: a comparison with psychiatric units and hospitals." Irish Journal of Medical Science **179**(1): 85-89.	Exclude: Uses data from the Republic or Ireland
Dargan, D. P., et al. (2016). "Three-year outcomes of intracapsular femoral neck fractures fixed with sliding hip	Exclude: Reports those with a documented history of alcohol dependence, not a current diagnosis

screws in adults aged under sixty-five years." Injury **47**(11): 2495-2500.	
Dasgupta, P. and J. Barber (2004). "Admission patterns of patients with personality disorder." Psychiatric Bulletin **28**(9): 321-323.	Exclude: Reports prevalence of 'alcohol or substance misuse'
De Burca, C., et al. (2013). "Substance use amongst mentally disordered offenders in medium security: Prevalence and relationship to offending behaviour." Journal of Forensic Practice **15**(4): 259-268.	Exclude: Reports 'heavy past use'
Dean, G., et al. (1981). "First admissions to psychiatric hospitals in south-east England in 1976 among immigrants from Ireland." British Medical Journal **282**(6279): 1831-1833.	Exclude: Reports first hospital admission rate for alcohol disorders among Irish immigrants/100000 of the population not in hospital prevalence
Dean, G., et al. (1981). "First admissions of native-born and immigrants to psychiatric hospitals in South-East England 1976." The British journal of psychiatry : the journal of mental science **139**: 506-512.	Exclude: Reports first hospital admission rate for alcohol disorders/100000 of the population not in hospital prevalence
Deluca, P., et al. (2010). "Challenges and solutions in implementing screening and brief interventions for hazardous alcohol use in accident and emergency departments." Alcoholism: Clinical and Experimental Research **34 (6)**: 294A.	Exclude: Duplicate data of Drummond 2014
Dennis, M., et al. (1997). "An examination of the accident and emergency management of deliberate self harm." Journal of Accident and Emergency Medicine **14**(5): 311-315.	Exclude: Reports prevalence of alcohol dependence among episodes of self-harm not among individual patients.
Dent, A., et al. (2010). "The impact of frequent attenders on a UK emergency department." European Journal of Emergency Medicine **17**(6): 332-336.	Exclude: Reports compound prevalence of 'concurrent alcohol use or long-term alcohol dependence' and 'presenting complaint of alcohol intoxication, not all cases'
Duffy, J. and N. Kreitman (1993). "Risk factors for suicide and undetermined death among in-patient alcoholics in Scotland." Addiction **88**(6): 757-766.	Exclude: No reported denominator unable to calculate prevalence
Eagles, J. M. and J. A. Besson (1985). "Changes in the incidence of alcohol-related problems in north-east Scotland, 1974-1982." The British journal of psychiatry : the journal of mental science **147**: 39-43.	Exclude: No calculable prevalence of alcohol specific diagnosis reported
Eardley, W. G., et al. (2006). "Human bite injury in North East England--the impact of alcohol intake on a mode of violent assault." Journal of the Royal Army Medical Corps **152**(1): 22-25.	Exclude: Reports people who were 'under the influence of alcohol'
El-Maaytah, M., et al. (2008). "The effect of the new "24 hour alcohol licensing law" on the incidence of facial trauma in London." The British journal of oral & maxillofacial surgery **46**(6): 460-463.	Exclude: Reports 'alcohol associated head and neck trauma'
Exiara, T., et al. (2012). "Hospital-acquired pneumonia in non-ICU patients in a rural general hospital." Clinical Microbiology and Infection **18**: 276-277.	Exclude: Unclear country of study
Finnegan, A., et al. (2007). "A review of one year of British Armed Forces mental health hospital admissions." Journal of the Royal Army Medical Corps **153**(1): 26-31.	Exclude: Military Hospital Inpatients
Fortune, Z., et al. (2011). "Clinical and economic outcomes from the UK pilot psychiatric services for personality-disordered offenders." International Review of Psychiatry **23**(1): 61-69.	Exclude: Reports a 'history of alcohol misuse'
Foster, J. H., et al. (2000). "Measurement of quality of life in alcohol-dependent subjects by a cancer symptoms checklist." Alcohol **20**(2): 105-110.	Exclude: Alcohol dependent cohort recruited; Nil calculable prevalence of alcohol specific diagnosis
Fothergill, N. J. and K. Hashemi (1990). "A prospective study of assault victims attending a suburban A&E department." Archives of emergency medicine **7**(3): 172-177.	Exclude: Reports alcohol consumption in relation to assault

Gaughran, F., et al. (2014). "Cardiovascular risk, lifestyle choices and substance use in the first year of psychosis." Early Intervention in Psychiatry **1)**: 27.	Exclude: Unclear if inpatient cohort
Geary, T., et al. (2012). "A national service evaluation of the impact of alcohol on admissions to Scottish intensive care units." Anaesthesia **67**(10): 1132-1137.	Exclude: Reports 'alcohol-related admissions'
Gho, J. M. I. H., et al. (2018). "An electronic health records cohort study on heart failure following myocardial infarction in England: Incidence and predictors." BMJ Open **8 (3) (no pagination)**(e018331).	Exclude: Reports "Excess Alcohol Consumption"
Goldacre, M. J. and S. E. Roberts (2004). "Hospital admission for acute pancreatitis in an English population, 1963-98: Database study of incidence and mortality." British Medical Journal **328**(7454): 1466-1469.	Exclude: No aetiology of pancreatitis reported
Goldbeck, R., et al. (2012). "Alcohol and drug misuse, risk of re-admission to a general hospital and psychiatric contact." Scottish Medical Journal **57**(1): 60.	Exclude: Reports on a hypothetical cohort of patients identified as high risk based on previous A&E visits, does not report an in hospital calculable prevalence
Goodall, J. A. and C. Bryan (1988). "The low incidence of alcoholic cirrhosis in the islands of Lewis and Harris." Scottish Medical Journal **33**(2): 229-230.	Exclude: No denominator reported for cases in hospital. Unclear if number of incident cases refers to those in hospital or in wider population
Graham, J. D. P., et al. (1979). "Self poisoning - a decennial survey from Cardiff." Public Health **93**(4): 223-229.	Exclude: Reports 'alcohol or other drugs'
Green, B. H. and E. C. Griffiths (2014). "Hospital admission and community treatment of mental disorders in England from 1998 to 2012." General Hospital Psychiatry **36**(4): 442-448.	Exclude: Reports 'Alcohol related admissions'
Green, M. A., et al. (2017). "Trends in alcohol-related admissions to hospital by age, sex and socioeconomic deprivation in England, 2002/03 to 2013/14." BMC Public Health **17**(1): 412.	Exclude: Reports number of admissions to hospital with alcohol conditions but no denominator to calculate in hospital prevalence
Greig, E., et al. (2012). "Maternal and neonatal outcomes following methadone substitution during pregnancy." Archives of Gynecology & Obstetrics **286**(4): 843-851.	Exclude: Reports prevalence of alcohol abuse in pregnant women attending substance misuse clinic not inpatients
Griffin, E., et al. (2014). "Characteristics of hospital-treated intentional drug overdose in Ireland and Northern Ireland." BMJ Open **4 (7) (no pagination)**(e005557).	Exclude: Reports 'Alcohol involvement' in intentional poisoning cases
Haddock, G., et al. (2018). "Influence of age on outcome of psychological treatments in first-episode psychosis." British Journal of Psychiatry **188**(3): 250-254.	Exclude: Includes inpatients and day patients in cohort, no separately calculable inpatient prevalence
Halbgewachs, C., et al. (2011). "Substance abuse amongst adolescents in modern suburban ireland." Acta Paediatrica, International Journal of Paediatrics **463)**: 20.	Exclude: Conducted in the Republic of Ireland
Halikas, J. A., et al. (1981). "Psychiatric diagnosis among female alcoholics." Curr Alcohol **8**: 283-291.	Exclude: Study conducted in the USA
Harris, J., et al. (2003). "Prior Alcoholics Anonymous (AA) affiliation and the acceptability of the Twelve Steps to patients entering UK statutory addiction treatment." Journal of Studies on Alcohol **64**(2): 257-261.	Exclude: Entering Alcohol Detoxification Unit
Harrison, D. and J. Chick (1994). "Trends in alcoholism among male doctors in Scotland." Addiction **89**(12): 1613-1617.	Exclude: Reports admissions and discharges of male doctors with alcohol problems
Hatton, J., et al. (2009). "Drinking patterns, dependency and life-time drinking history in alcohol-related liver disease." Addiction **104**(4): 587-592.	Exclude: Inpatient and outpatient cohort, no denominator reported for total inpatient population
Hawton, K. (1981). "The long-term outcome of psychiatric morbidity detected in general medical patients." Journal of Psychosomatic Research **25**(3): 237-243.	Exclude: Follow up study of inpatients discharged from hospital
Hawton, K., et al. (2007). "Self-harm in England: A tale of three cities: Multicentre study of self-harm." Social Psychiatry and Psychiatric Epidemiology **42**(7): 513-521.	Exclude: Reports alcohol consumption in relation to self-harm
Hawton, K., et al. (2012). "Epidemiology and nature of self-harm in children and adolescents: Findings from the	Exclude: Reports alcohol involvement with self-harm

multicentre study of self-harm in England." European Child and Adolescent Psychiatry **21**(7): 369-377.	
Haynes, C. L. and G. A. Cook (2009). "An audit of health education services within UK hospitals." Journal of Evaluation in Clinical Practice **15**(4): 704-712.	Exclude: Reports an audit for number of patients screened for alcohol misuse
Hearnshaw, S. A., et al. (2011). "Acute upper gastrointestinal bleeding in the UK: patient characteristics, diagnoses and outcomes in the 2007 UK audit." Gut **60**(10): 1327-1335.	Exclude: Reports a 'history of alcohol excess'
Heatley, M. K. and J. Crane (1989). "Acute pancreatitis as a cause of sudden or unexpected death in Northern Ireland." Ulster Medical Journal **58**(1): 51-55.	Exclude: Reports alcoholic pancreatitis prevalence in only deaths of people with pancreatitis
Henson, V. L. and D. S. Vickery (2005). "Patient self discharge from the emergency department: who is at risk?" Emergency Medicine Journal **22**(7): 499-501.	Exclude: Reports 'under the influence of drugs or alcohol'
Herbert, A., et al. (2015). "Violence, self-harm and drug or alcohol misuse in adolescents admitted to hospitals in England for injury: a retrospective cohort study." BMJ Open **5**(2): e006079.	Exclude: Reports 'drug or alcohol misuse'
Herbert, A., et al. (2017). "Time-trends in rates of hospital admission of adolescents for violent, self-inflicted or drug/alcohol-related injury in England and Scotland, 2005-11: population-based analysis." Journal of public health (Oxford, England) **39**(1): 65-73.	Exclude: Reports drug/alcohol related injury
Heydtmann, M. and S. A. McDonald (2013). "Survival and re-admission of patients admitted with alcoholic liver disease to a West of Scotland hospital." Scottish Medical Journal **58**(3): 134-138.	Exclude: Reports on an initial cohort of alcoholic liver disease inpatients
Heyes, G. J., et al. (2017). "Predictors for 1-year mortality following hip fracture: a retrospective review of 465 consecutive patients." European journal of trauma and emergency surgery : official publication of the European Trauma Society **43**(1): 113-119.	Exclude: Reports 'alcohol excess'
Hiles, S., et al. (2015). "General hospital-treated self-poisoning in England and Australia: comparison of presentation rates, clinical characteristics and aftercare based on sentinel unit data." Journal of Psychosomatic Research **78**(4): 356-362.	Exclude: Reports alcohol users among any substance misusers
Hocking, M. A. (1989). "Assaults in south east London." Journal of the Royal Society of Medicine **82**(5): 281-284.	Exclude: Reports 'Alcohol a contributing factor'
Hodgins, S., et al. (2008). "From conduct disorder to severe mental illness: Associations with aggressive behaviour, crime, and victimization." Psychological Medicine **38**(7): 975-987.	Exclude: Duplicate data of Hodgins 2007
Hodgins, S., et al. (2009). "Do community mental health teams caring for severely mentally ill patients adjust treatments and services based on patients' antisocial or criminal behaviours?.[Erratum appears in Eur Psychiatry. 2009 Dec;24(8):552 Note: Sainz-Fuentes, R [corrected to Sainz-Fuertes, R]]." European Psychiatry: the Journal of the Association of European Psychiatrists **24**(6): 373-379.	Exclude: Duplicate data from Hodgins 2007
Holding, T. A., et al. (1977). "Parasuicide in Edinburgh--a seven-year review 1968-74." The British journal of psychiatry : the journal of mental science **130**: 534-543.	Exclude: Reports 'Problem with alcohol'
Holloway, A. S., et al. (2007). "The effect of brief interventions on alcohol consumption among heavy drinkers in a general hospital setting." Addiction **102**(11): 1762-1770.	Exclude: Reports prevalence of 'excess drinking' not alcohol specific diagnosis
Holloway, A. and H. E. Watson (2000). "Screening for hazardous/harmful alcohol consumption amongst general hospital in-patients: establishing concurrent validity of the	Exclude: Reports number of people drinking over nationally defined limits not diagnostic category. Conducts AUDIT on this subset but no numbers are reported figure too small to adequately classify numbers

Alcohol Use Disorders Identification Test in the UK." Journal of Substance Use **5**(3): 263-271.	
Holmes, W. J. M., et al. (2009). "Alcohol and burns - Impact on a regional burns centre." Burns **1)**: S10-S11.	Exclude: Abstract of Holmes 2010
Hoskins, R. and J. Benger (2013). "What is the burden of alcohol-related injuries in an inner city emergency department?" Emergency medicine journal : EMJ **30**(3): e21.	Exclude: Reports prevalence of alcohol related attendances to A+E not specific alcohol diagnoses. No numbers quoted for alcoholic pancreatitis
Howarth, M., et al. (2012). "Association of water softness and heavy alcohol consumption with higher hospital admission rates for alcoholic liver disease." Alcohol & Alcoholism **47**(6): 688-696.	Exclude: No inpatient alcohol specific prevalence calculable
Hoy, A. R. (2017). "Which young people in England are most at risk of an alcohol-related revolving-door readmission career?" BMC Public Health **17**(1): 185.	Exclude: Reports on cohort of young people with alcohol related ICD-10 code, but no calculable alcohol specific diagnosis prevalence available in cohort studied
Huang-Doran, I., et al. (2015). "Early in-patient management of alcohol-related liver disease: Results of a liver care bundle to improve quality of care." Gut **1)**: A186.	Exclude: Alcoholic Cirrhosis Cohort; No prevalence calculable
Hudson, S. A., et al. (2008). "Validation of a screening instrument for post-traumatic stress disorder in a clinical sample of older adults." Aging & Mental Health **12**(5): 670-673.	Exclude: Inpatients or Day patients no breakdown given
Iozzino, L., et al. (2015). "Prevalence and risk factors of violence by psychiatric acute inpatients: A systematic review and meta-analysis." PLoS ONE **10 (6) (no pagination)**(e012853).	Exclude: Reports 'lifetime history of alcohol abuse'
Jacobs, R., et al. (2015). "Determinants of hospital length of stay for people with serious mental illness in England and implications for payment systems: a regression analysis." BMC Health Services Research **15**: 439.	Exclude: Reports 'alcohol and substance misuse'
Jamieson, C. P., et al. (1999). "The thiamin, riboflavin and pyridoxine status of patients on emergency admission to hospital." Clinical nutrition (Edinburgh, Scotland) **18**(2): 87-91.	Exclude: Reports 'alcohol intake'
Jauhar, P. and A. S. Watson (1995). "Severity of alcohol dependence in the East End of Glasgow." Alcohol & Alcoholism **30**(1): 67-70.	Exclude: Reports on a cohort of alcohol dependent inpatients, no prevalence calculable
Johnstone, M. A., et al. (1991). "Children's admission to I.C.U. with ethanol poisoning." Pediatric Reviews and Communications **6**(2): 119-122.	Exclude: Case series of ethanol poisoning. No denominator reported to calculate prevalence
Jones, J. J. and R. V. Jeffreys (1983). "Head injury patients admitted to general hospitals in Merseyside." Injury **14**(6): 483-488.	Exclude: Reports number of patients who had taken alcohol
Keaney, F., et al. (2011). "Physical health problems among patients seeking treatment for substance use disorders: A comparison of drug dependent and alcohol dependent patients." Journal of Substance Use **16**(1): 27-37.	Exclude: Reports on mixed in and outpatient cohort
Kellezi, B., et al. (2017). "The impact of psychological factors on recovery from injury: A multicentre cohort study." Social Psychiatry and Psychiatric Epidemiology **52**(7): 855-866.	Exclude: Reports alcohol problems
Kendrick, D., et al. (2017). "Psychological morbidity and health-related quality of life after injury: Multicentre cohort study." Quality of Life Research: An International Journal of Quality of Life Aspects of Treatment, Care & Rehabilitation **26**(5): 1233-1250.	Exclude: No alcohol specific diagnosis prevalence reported in study cohort
Keown, P., et al. (2008). "Retrospective analysis of hospital episode statistics, involuntary admissions under the Mental Health Act 1983, and number of psychiatric beds in England 1996-2006." BMJ **337**: a1837.	Exclude: Reports 'drug and alcohol related problems'

Kilich, S. and M. A. Plant (1981). "Regional variations in the levels of alcohol-related problems in Britain." British Journal of Addiction **76**(1): 47-62.	Exclude: Reports alcohol-related first admissions
Kreitman, N. and M. Schreiber (1979). "Parasuicide in young Edinburgh women, 1968--75." Psychological Medicine **9**(3): 469-479.	Exclude: No calculable prevalence of chronic alcohol dependence reported
Kriese, S., et al. (2015). "Complex symptom burden and unmet need in end-stage liver disease." Gut **1)**: A264-A265.	Exclude: Mixed inpatient and outpatient cohort
Krishel, S. and L. J. Baraff (1996). "Feasibility of routine screening of patients for alcohol abuse." Academic emergency medicine : official journal of the Society for Academic Emergency Medicine **3**(9): 903-905.	Exclude: Study conducted in the USA
Latcham, R. W. and N. Kreitman (1984). "Regional variation in alcoholism rates in Britain: The effect of provision and use of services." International Journal of Epidemiology **13**(4): 442-446.	Exclude: Reports number of admission per population not inpatient prevalence
Latcham, R. W., et al. (1984). "Regional variations in British alcohol morbidity rates: a myth uncovered? I: Clinical surveys." British medical journal (Clinical research ed.) **289**(6455): 1341-1343.	Exclude: Sample of inpatients with alcohol misuse interviewed
Lawrie, S. M., et al. (1995). "Psychosis and substance abuse: cause, effect or coincidence?" Scottish Medical Journal **40**(6): 174-176.	Exclude: Reports 'Excessive consumption of alcohol '
Lewis, S., et al. (2018). "Randomised controlled trial of cognitive-behavioural therapy in early schizophrenia: Acute-phase outcomes." British Journal of Psychiatry **181**(S43): s91-s97.	Exclude: Includes inpatients and day patients in cohort, no separately calculable inpatient prevalence
Lewsey, J., et al. (2016). "Hospital admissions and associated costs of alcoholic liver disease in Scotland between 1991 and 2011." Gut **65 (Supplement 1)**: A270.	Exclude: Reports incident ALD admissions, no denominator reported or prevalence calculable
Lloyd, G., et al. (1982). "Screening for problem drinkers among medical inpatients." Drug Alcohol Depend. **10**(4): 355-359.	Exclude: Reports prevalence of 'alcohol problems or if the patient had previously been in alcohol treatment'
Lumsden, J., et al. (2005). "The prevalence of early onset alcohol abuse in mentally disordered offenders." Journal of Forensic Psychiatry & Psychology **16**(4): 651-659.	Exclude: Reports a 'history of alcohol abuse' not current diagnosis
MacIntyre, D., et al. (2004). "Substance misuse in a high security hospital: Three years of urine drug testing at the State Hospital, Carstairs." Journal of Forensic Psychiatry & Psychology **15**(4): 606-619.	Exclude: Nil specific alcohol diagnosis prevalence reported
Mackle, I. J., et al. (2006). "One year outcome of intensive care patients with decompensated alcoholic liver disease." British Journal of Anaesthesia **97**(4): 496-498.	Exclude: Reports on alcoholic liver disease cohort, no calculable alcohol specific diagnosis prevalence
Maguire, H. C. (1988). "Alcohol and acute hospital admissions." Irish Medical Journal **81**(1): 32-35.	Exclude: Based in Dublin, Ireland
Mallawaarachchi, N., et al. (2016). "Does the use of non-selective beta-blockers in cirrhosis patients with ascites result in increased mortality?" Journal of Hepatology **1)**: S278-S279.	Exclude: No prevalence of alcoholic cirrhosis reported
Mangrolia, N., et al. (2010). "United kingdom model for end-stage liver disease and model for end stage liver disease scores predict outcome after oesophageal variceal haemorrhage." Gut **59 (Supplement 1)**: A104.	Exclude: Reports the number of cases of oesophageal variceal haemorrhage which were alcohol related
Marley, W. D., et al. (2015). "Alcohol-Related Fracture Admissions: A Retrospective Observational Study." The Ulster medical journal **84**(2): 94-97.	Exclude: Patients admitted to trauma and orthopaedic unit. Unclear if inpatient cohort
Martin, D. and D. Smith "Unipolar mania: A discrete nosological entity within a broad bipolar spectrum? Information from the Bipolar Disorder Research Network Study." Bipolar Disorders. Conference: 10th International	Exclude: Not inpatient cohort

Conference on Bipolar Disorder. Miami Beach, FL United States. Conference Publication: **15**(SUPPL.1): 155.	
Mason, C., et al. (2015). "Early in-patient management of alcohol-related liver disease: Results of a liver care bundle to improve quality of care." United European Gastroenterology Journal **1)**: A154.	Exclude: Alcoholic Liver Disease Cohort, No prevalence calculable
Mather, H. M. and D. H. Marjot (1989). "Alcohol-related admissions to a psychiatric hospital: A comparison of Asians and Europeans." British Journal of Addiction **84**(3): 327-329.	Exclude: Reports on cohort of inpatients with 'alcohol problems'
Mathers, D. C., et al. (1991). "Cannabis use in a large sample of acute psychiatric admissions." British Journal of Addiction **86**(6): 779-784.	Exclude: Reports 'people drinking X units/day'
Mayou, R. and K. Hawton (1986). "Psychiatric disorder in the general hospital." The British Journal of Psychiatry **149**: 172-190.	Exclude: Systematic Review all references check for inclusion
Mayou, R., et al. (1991). "Psychiatric problems among medical admissions." International Journal of Psychiatry in Medicine **21**(1): 71-84.	Exclude: Reports 'problem drinking'
Mayou, R., et al. (1994). "Use of psychiatric services by patients referred to a consultation unit." General Hospital Psychiatry **16**(5): 354-357.	Exclude: Reports Alcohol Problems
McDonald, S. A., et al. (2010). "Hospitalization of hepatitis C-diagnosed individuals in Scotland for decompensated cirrhosis: a population-based record-linkage study." European Journal of Gastroenterology & Hepatology **22**(1): 49-57.	Exclude: Reports alcohol related hospital admissions
McGrath, J. C. (2008). "Fear of falling after brain injury." Clinical Rehabilitation **22**(7): 635-645	Exclude: Reports prevalence of 'premorbid alcohol misuse' or a history of alcohol misuse not current diagnosis
McMahon, C., et al. (2003). "Changes in patterns of excessive alcohol consumption in 25 years of high security hospital admissions from England and Wales." Criminal Behaviour & Mental Health **13**(1): 17-30.	Exclude: Reports 'problem drinkers'
McMurray, J. J., et al. (1987). "Trends in analgesic self-poisoning in West-Fife, 1971-1985." The Quarterly journal of medicine **65**(246): 835-843.	Exclude: Reports 'alcohol taken in conjunction with self-poisoning'
McPeake, J., et al. (2014). "Alcohol related admissions to ICU: An 18 month prospective cohort study." Critical Care Medicine **1)**: A1459.	Exclude: Conference Abstract of McPeake 2015
Miller, P. M., et al. (2000). "Differences between patients with schizophrenia within and without a high security psychiatric hospital." Acta Psychiatrica Scandinavica **102**(1): 12-18	Exclude: Reports history of alcohol misuse prior to index admission not current diagnosis
Millett, E. R. C., et al. (2015). "Risk factors for hospital admission in the 28 days following a community-acquired pneumonia diagnosis in older adults, and their contribution to increasing hospitalisation rates over time: A cohort study." BMJ Open **5 (12) (no pagination)**(e008737).	Exclude: Reports prevalence of excessive alcohol consumption
Misselbrook, G. P. and N. Sudhan (2014). "Epidemiology and critical care management of patients admitted after intentional self-poisoning." Critical Care **1)**: S25-S26.	Exclude: Reports 'a history of alcohol misuse', not current diagnosis
Mitchell, V., et al. (2018). "Exploring psychiatric morbidity in the scottish burn injury population." Critical Care Medicine **46 (Supplement 1)**: 762.	Exclude: Reports compound prevalence "mental and behavioural disorders due to use of alcohol"
Morleo, M., et al. (2011). "Under-reporting of foetal alcohol spectrum disorders: an analysis of hospital episode statistics." BMC Pediatrics **11**: 14.	Exclude: Reports incidence rate of FASD per population, no in hospital denominator calculable
Mostafa, S. M. and B. V. S. Murthy (2002). "Alcohol-associated admissions to an adult intensive care unit: an	Exclude: No alcohol specific diagnosis prevalence reported

audit." European Journal of Anaesthesiology (EJA) **19**(3): 193-196.	
Mulinga, J. D. (1999). "Elderly people with alcohol-related problems: Where do they go?" International Journal of Geriatric Psychiatry **14**(7): 564-566.	Exclude: Reports on cohort of alcohol dependent inpatients; No calculable prevalence of alcohol specific diagnosis reported
Murphy, H. B. and G. Vega (1982). "Schizophrenia and religious affiliation in Northern Ireland." Psychological Medicine **12**(3): 595-605.	Exclude: Reports first admission rates
Newton, A., et al. (2007). "Impact of the new UK licensing law on emergency hospital attendances: a cohort study." Emergency Medicine Journal **24**(8): 532-534.	Exclude: Reports 'alcohol related' attendance
Northcote, R. J., et al. (1983). "Changing pattern of alcohol abuse in female acute medical admissions." British medical journal (Clinical research ed.) **286**(6379): 1702.	Exclude: Reports number of people whose admissions were considered to be due to the effects of alcohol
Northridge, D. B., et al. (1986). "Association between liberalisation of Scotland's liquor licensing laws and admissions for self poisoning in West Fife." British Medical Journal **293**(6560): 1466-1468.	Exclude: Reports 'alcohol taken with cases of self-poisoning'
O'Loughlin, S. and J. Sherwood (2005). "A 20-year review of trends in deliberate self-harm in a British town, 1981-2000." Social Psychiatry & Psychiatric Epidemiology **40**(6): 446-453.	Exclude: Reports alcohol consumed at time of injury
Owen, G. S., et al. (2009). "Mental capacity, diagnosis and insight in psychiatric in-patients: a cross-sectional study." Psychological Medicine **39**(8): 1389-1398.	Exclude: Reports compound outcome drug or alcohol misuse
Owens, L., et al. (2016). "A Randomized Controlled Trial of Extended Brief Intervention for Alcohol-Dependent Patients in an Acute Hospital Setting." Alcohol and alcoholism (Oxford, Oxfordshire) **51**(5): 584-592.	Exclude: Baseline group alcohol use disorder, no calculable prevalence of an alcohol specific diagnosis
Pakpoor, J., et al. (2014). "Alcohol-use disorders and multiple sclerosis risk: A national record-linkage study." Multiple Sclerosis **1)**: 148-149.	Exclude: No prevalence calculable; No denominator given
Papastergiou, V., et al. (2014). "Nine scoring models for short-term mortality in alcoholic hepatitis: Cross-validation in a biopsy-proven cohort." Alimentary Pharmacology and Therapeutics **39**(7): 721-732.	Exclude: Primary cohort alcoholic hepatitis, no calculable alcohol specific diagnosis within cohort
Parfitt, V. J. and R. Bhake (2012). "An analysis of all cases of severe hypoglycaemia presenting to a major teaching hospital over one year." Diabetic Medicine **1)**: 131.	Exclude: Reports prevalence of alcohol-induced hypoglycaemia
Parker, R., et al. (2017). "Clinical and microbiological features of infection in alcoholic hepatitis: an international cohort study." Journal of gastroenterology **52**(11): 1192-1200.	Exclude: Included cohort of alcoholic hepatitis patient, no calculable prevalence of alcohol specific diagnosis
Parkinson, K., et al. (2016). "Prevalence of alcohol related attendance at an inner city emergency department and its impact: a dual prospective and retrospective cohort study." Emergency Medicine Journal **33**(3): 187-193.	Exclude: Reports prevalence of 'alcohol-related attendance' and BAC positivity
Paton, L., et al. (2016). "Utility of the PRE-DELIRIC delirium prediction model in a Scottish ICU cohort." The Journal of the Intensive Care Society **17**(3): 202-206.	Exclude: 'Reports alcohol or drug misuse'
Pentland, B., et al. (2005). "Late mortality after head injury." Journal of Neurology, Neurosurgery & Psychiatry **76**(3): 395-400.	Exclude: Reports alcohol dependence prevalence in a cohort of patients who died
Pentland, B., et al. (1986). "Head injury in the elderly." Age and ageing **15**(4): 193-202.	Exclude: Reports 'alcohol as a contributory factor'
Peppiatt, R., et al. (1978). "Blood alcohol concentrations of patients attending an accident and emergency department." Resuscitation **6**(1): 37-43.	Exclude: Reports 'detectable blood alcohol concentration'
Petrova, M., et al. (2011). "Patient characteristics and outcomes in a 'hub and spoke model' for liver transplantation provision: The South West Liver Unit/King's College experience." Gut **2)**: A37.	Exclude: Unclear if inpatient cohort

Phang, I., et al. (2012). "Paediatric head injury admissions over a 10-year period in a regional neurosurgical unit." Scottish Medical Journal **57**(3): 152-156.	Exclude: Reports 'Alcohol involvement'
Phillips, P. and S. Johnson (2003). "Drug and alcohol misuse among in-patients with psychotic illnesses in three inner-London psychiatric units." Psychiatric Bulletin **27**(6): 217-220.	Exclude: Reports 'drug and/or alcohol misuse or dependence'
Pirmohamed, M., et al. (2000). "The burden of alcohol misuse on an inner-city general hospital." QJM - Monthly Journal of the Association of Physicians **93**(5): 291-295.	Exclude: Reports 'alcohol induced medical illness'
Potts, J. R., et al. (2013). "Determinants of long-term outcome in severe alcoholic hepatitis." Alimentary Pharmacology & Therapeutics **38**(6): 584-595.	Exclude: Reports on cohort of alcoholic hepatitis patients, no calculable alcohol diagnosis prevalence reported
Quayle, M., et al. (1998). "Alcohol and secure hospital patients: I. An examination of the nature and prevalence of alcohol problems in secure hospital patients." Psychology, Crime & Law **4**(1): 27-41.	Exclude: Reports numbers of 'low' 'medium' and 'high dependency based on SADD and Hilton scales but this adds up to 100% unclear how correlates with ICD10 diagnosis of alcohol dependence
Rainey, S. R., et al. (2015). "The impact of violence reduction initiatives on emergency department attendance." Scottish Medical Journal **60**(2): 90-94.	Exclude: Reports 'alcohol consumption'
Ramayya, A. and P. Jauhar (1997). "Increasing incidence of Korsakoff's psychosis in the east end of Glasgow." Alcohol & Alcoholism **32**(3): 281-285.	Exclude: Reports Incidence of Korsakoff's Psychosis in the general population
Rasoul, D., et al. (2016). "Psychiatric co-morbidities and tendencies in patients with non-ischaemic heart failure (NIHF) - A large observational cohort study spanning 14 years." Heart **102 (Supplement 6)**: A7.	Exclude: Reports compound outcome 'mainly made up by alcohol and tobacco abuse'
Ratib, S., et al. (2014). "Diagnosis of liver cirrhosis in England, a cohort study, 1998-2009: A comparison with cancer." American Journal of Gastroenterology **109**(2): 190-198.	Exclude: Not inpatient cohort
Redfern, T. R., et al. (1988). "The impact of alcohol ingestion on the orthopaedic and accident service." Alcohol and alcoholism (Oxford, Oxfordshire) **23**(5): 415-419.	Exclude: Reports alcohol use at the time of trauma
Reeves, G. K., et al. (2014). "Hospital admissions in relation to body mass index in UK women: a prospective cohort study." BMC Medicine **12**: 45.	Exclude: Reports Alcohol intake in Million Women Study Participants
Rhouma, O., et al. (2013). "Facial injuries in Scotland 2001-2009: epidemiological and sociodemographic determinants." British Journal of Oral & Maxillofacial Surgery **51**(3): 211-216.	Exclude: 'Reports alcohol related facial injury
Ritchie, G., et al. (2004). "The detection and treatment of substance abuse in offenders with major mental illness: an intervention study." Medicine, Science & the Law **44**(4): 317-326.	Exclude: Reports historical problems associated with alcohol
Rizzo, M. and S. Smith (2012). "Risk assessment and risk management among severely mentally ill patients requiring hospitalisation." Journal of Forensic Psychiatry & Psychology **23**(4): 497-509.	Exclude: Duplicate data from Hodgins 2007
Roberts, S. E., et al. (2005). "Trends in mortality after hospital admission for liver cirrhosis in an English population from 1968 to 1999." Gut **54**(11): 1615-1621.	Exclude: Reports number of admissions of alcohol related diagnosis but no denominator, prevalence not calculable
Roberts, S. E., et al. (2014). "Mortality following acute pancreatitis: social deprivation, hospital size and time of admission: record linkage study." BMC Gastroenterology **14**: 153.	Exclude: Reports prevalence of number of cases of acute pancreatitis not number of patients as reported in paper
Roberts, S. E., et al. (2013). "The incidence of acute pancreatitis: Impact of social deprivation, alcohol consumption, seasonal and demographic factors." Alimentary Pharmacology and Therapeutics **38**(5): 539-548.	Exclude: Denominator of cases derived from inpatient and primary care records, not pure inpatient sample

Robertson, M., et al. (2017). "AIMS65, a risk stratification score for upper gastrointestinal bleeding, accurately predicts mortality in patients presenting with acute variceal bleeding: A multicenter cohort study." Gastrointestinal Endoscopy **85 (5 Supplement 1)**: AB69.	Exclude: Unclear in which country research undertaken
Roche, A. M., et al. (2006). "From data to evidence, to action: Findings from a systematic review of hospital screening studies for high risk alcohol consumption." Drug and Alcohol Dependence 83(1): 1-14.	Exclude: Systematic review checked for all additional references
Rowland, N., et al. (1992). "Screening for patients at risk of alcohol related problems: the results of the York District Hospital Alcohol Study." Health Trends **24**(3): 99-102.	Exclude: Reports number of people 'at risk' of drinking problems
Sadler, S., et al. (2017). "Understanding the alcohol harm paradox: an analysis of sex- and condition-specific hospital admissions by socio-economic group for alcohol-associated conditions in England." Addiction (Abingdon, England) **112**(5): 808-817.	Exclude: Reports admission rates per population, no denominator given no in hospital prevalence calculable.
Sagar, N., et al. (2013). "An audit to evaluate the use of the alcohol fast screening tool in acute medical admissions in a district general hospital." Gut **2)**: A12-A13.	Exclude: Reports prevalence of 'drinking over the national limit'
Scheffler, A., et al. (1987). "Alcohol-related problems amongst selected hospital patients and the cost incurred in their care." British Journal of Addiction **82**(3): 275-283.	Exclude: Reports on alcohol related discharges but no denominator reported to calculate prevalence
Schoepf, D. and R. Heun (2014). "Bipolar disorder and comorbidity: Increased prevalence and increased relevance of comorbidity for hospital-based mortality during a 12.5-year observation period in general hospital admissions." Journal of Affective Disorders **169**: 170-178.	Exclude Duplicate reporting of data from Schoepf 2015
Scott, M. L., et al. (2011). "The impact of alcohol on critical care referrals and admissions in portsmouth, UK." Intensive Care Medicine **1)**: S23.	Exclude: Doesn't report prevalence of wholly attributable alcohol condition
Shaik-Dawood, A. M., et al. (2011). "Long-term survival of alcoholic liver disease following critical care admission: A national cohort study." Journal of the Intensive Care Society **12 (1)**: 69.	Exclude: Reports on cohort of patients in ICU with alcoholic liver disease, no denominator reported for calculable prevalence. No other alcohol specific diagnosis prevalence calculable
Shepherd, J., et al. (1988). "Assault: characteristics of victims attending an inner-city hospital." Injury **19**(3): 185-190.	Exclude: Reports 'alcohol intake'
Shepherd, R. M., et al. (1995). "Prevalence of alcohol histories in medical and nursing notes of patients admitted with self poisoning.[Erratum appears in BMJ 1995 Oct 14;311(7011):990]." BMJ **311**(7009): 847.	Exclude: Reports prevalence of 'excessive drinking'
Simpson, A., et al. (2011). "The relationship between substance use and exit security on psychiatric wards." Journal of Advanced Nursing **67**(3): 519-530.	Exclude: Reports alcohol use
Simpson, T., et al. (2001). "Saliva alcohol concentrations in accident and emergency attendances." Emergency medicine journal : EMJ **18**(4): 250-254.	Exclude: Reports positive alcohol saliva test
Singh, R., et al. (2018). "Prevalence of depression after TBI in a prospective cohort: The SHEFBIT study." Brain Injury **32**(1): 84-90.	Exclude: Reports 'alcohol intoxication at time of injury'
Singhal, A., et al. (2014). "Risk of self-harm and suicide in people with specific psychiatric and physical disorders: comparisons between disorders using English national record linkage." Journal of the Royal Society of Medicine **107**(5): 194-204.	Exclude: Reports number of admissions due to alcohol abuse in England. No denominator quoted in hospital prevalence not calculable
Siriwardena, A. K., et al. (2012). "Antioxidant therapy does not reduce pain in patients with chronic pancreatitis: the ANTICIPATE study." Gastroenterology **143**(3): 655-663.e651.	Exclude: Unclear if inpatient cohort

Stanley, J. L., et al. (2016). "Use of novel psychoactive substances by inpatients on general adult psychiatric wards." BMJ Open **6**(5): e009430.	Exclude: Reports compound outcome of harmful use or dependence
Stewart, D. and L. Bowers (2015). "Substance use and violence among psychiatric inpatients." Journal of Psychiatric and Mental Health Nursing **22**(2): 116-124.	Exclude: Reports a 'history of excessive alcohol use'
Stewart, D., et al. (2015). "Nursing interventions for substance use during psychiatric hospital admissions: Clinical context and predictors." International Journal of Mental Health Nursing **24**(6): 527-537.	Exclude: Reports 'problematic alcohol use as defined by doctor'
Strang, I., et al. (1978). "Head injuries in accident and emergency departments at Scottish hospitals." Injury **10**(2): 154-159.	Exclude: Reports 'alcohol use'
Teo, A. I. and J. G. Cooper (2013). "The epidemiology and management of adult poisonings admitted to the short-stay ward of a large Scottish emergency department." Scottish Medical Journal **58**(3): 149-153.	Exclude: Reports 'alcohol/substance misuse'
Thomson, S. J., et al. (2010). "A study of patients with cirrhosis admitted to nontransplant general intensive care in the UK: Prevalence, case mix, outcomes and evaluation of critical illness and disease-specific scoring systems." Critical Care **1)**: S181.	Exclude: Duplicate abstract of Thomson 2010
Thomson, S. J., et al. (2008). "Chronic liver disease--an increasing problem: a study of hospital admission and mortality rates in England, 1979-2005, with particular reference to alcoholic liver disease." Alcohol & Alcoholism **43**(4): 416-422.	Exclude: Reports rates of admission for alcoholic liver disease, in hospital prevalence not calculable
Tolley, K. and N. Rowland (1991). "Identification of alcohol-related problems in a general hospital setting: a cost-effectiveness evaluation." British Journal of Addiction **86**(4): 429-438.	Exclude: Reports number of patients screened for at risk drinking by different professional groups. Unclear if multiple patients being screened by different professionals or if unique patients, as such unclear if double counting and true prevalence reported.
Tulloch, A. D., et al. (2012). "Timing, prevalence, determinants and outcomes of homelessness among patients admitted to acute psychiatric wards." Social Psychiatry and Psychiatric Epidemiology **47**(7): 1181-1191.	Exclude: Reports 'lifetime diagnosis of drug or alcohol disorder'
Van Rompaey, B., et al. (2009). "Risk factors for delirium in intensive care patients: a prospective cohort study." Critical Care (London, England) **13**(3): R77.	Exclude: Reports alcohol use
Vardy, J., et al. (2009). "Are emergency department staffs' perceptions about the inappropriate use of ambulances, alcohol intoxication, verbal abuse and violence accurate?" Emergency medicine journal : EMJ **26**(3): 164-168.	Exclude: Reports prevalence of patients whom were 'acutely intoxicated', unclear which substance, and prevalence of patients with 'complaints related to chronic alcohol abuse
Virgo, N., et al. (2001). "The prevalence and characteristics of co-occurring serious mental illness (SMI) and substance abuse or dependence in the patients of Adult Mental Health and Addictions Services in eastern Dorset." Journal of Mental Health **10**(2): 175-188	Exclude: Reports 'current problematic use (abuse or dependence)' compound outcome in subset of acute inpatients
Wadd, S. and C. Papadopoulos (2014). "Drinking behaviour and alcohol-related harm amongst older adults: analysis of existing UK datasets." BMC Research Notes **7**: 741.	Exclude: Reports total alcohol-related hospital admissions (i.e. wholly and partly attributable) per 1,000 population not calculable in hospital prevalence
Waddell, T. S. and W. S. Hislop (2003). "Analysis of alcohol-related admissions in gastroenterology, cardiology and respiratory medicine." Scottish Medical Journal **48**(4): 114-116.	Exclude: Reports 'alcohol-related conditions'
Waring, W. S., et al. (2008). "Acute ethanol coingestion confers a lower risk of hepatotoxicity after deliberate acetaminophen overdose." Academic Emergency Medicine **15**(1): 54-58.	Exclude: Reports 'alcohol excess'
Watson, H. (2000). "Problem drinkers among acute care inpatients." Nursing Standard **14**(40): 32-35.	Exclude: Reports number of 'potential problem drinkers'

Watson, H. E., et al. (1991). "Alcohol problems among women in a general hospital ward." British Journal of Addiction **86**(7): 889-894.	Exclude: Reports 'newly identified' problem drinkers, doesn't fully report all alcohol abuse in cohort unable to accurately ascertain prevalence of alcohol abuse given newly diagnosed numbers reported
Webber, K. and A. N. Davies (2012). "An observational study to determine the prevalence of alcohol use disorders in advanced cancer patients." Palliative Medicine **26**(4): 360-367.	Exclude: Inpatient and Outpatient sample
Wheatley, M. (1998). "The prevalence and relevance of substance use in detained schizophrenic patients." The Journal of Forensic Psychiatry **9**(1): 114-129.	Exclude: Reports previous alcohol use not alcohol specific diagnosis
Wilkinson, S., et al. (2002). "Admissions to hospital for deliberate self-harm in England 1995-2000: An analysis of Hospital Episode Statistics." Journal of Public Health Medicine **24**(3): 179-183.	Exclude: Reports 'alcohol involvement'
Williams, E. R., et al. (2001). "Psychiatric status, somatisation, and health care utilization of frequent attenders at the emergency department: a comparison with routine attenders." Journal of Psychosomatic Research **50**(3): 161-167.	Exclude: Reports 'alcohol related diagnoses'
Williams, S., et al. (2005). "Hospital admissions for drug and alcohol use in people aged under 45." British Medical Journal **330**(7483): 115.	Exclude: Reports admission rates not calculable in hospital prevalence
Willox, D. G. (1985). "Self poisoning. A review of patients seen in the Victoria Infirmary, Glasgow." Scottish Medical Journal **30**(4): 220-224.	Exclude: Reports alcohol use at time of overdose
Wood, C. L., et al. (2013). "An audit of epidemiology of patients with non-traumatic coma presenting to a tertiary paediatric intensive care unit in South East Scotland." Developmental Medicine and Child Neurology **1)**: 60-61.	Exclude: No prevalence calculable for alcohol intoxication
Wright, J. and A. Kariya (1997). "Aetiology of assault with respect to alcohol, unemployment and social deprivation: A Scottish accident and emergency department case-control study." Injury **28**(5-6): 369-372.	Exclude: Reports recent consumption of alcohol
Wright, J. and A. Kariya (1997). "Assault patients attending a Scottish accident and emergency department." Journal of the Royal Society of Medicine **90**(6): 322-326.	Exclude: Reports alcohol consumption at time of assault
Wynne, H., et al. (1987). "Age and self-poisoning: the epidemiology in Newcastle upon Tyne in the 1980s." Human Toxicology **6**(6): 511-515.	Exclude: Reports overdose 'in conjunction with alcohol'
Yates, K., et al. (2000). "Changes in psychiatric admissions in rural northern England." Journal of Mental Health **9**(1): 105-111.	Exclude: Reports 'alcohol or drug related problems'

Table S2: Charicteristics of Included Studies

Study ID	Alcohol Diagnosis	Alcohol Diagnosis Diagnostic Assessment	Patient Sample Description	Setting	Year of data collection	Country	Mean Age	% Female	Total NOS Quality Score	Sample Size (n)
Mental and behavioural disorders due to use of alcohol (F10·x)										
Bradbury 1993(3)	Alcohol intoxication	NR	Private vehicle occupants admitted to A&E	A&E	NR	England	33	36·2	4	174
Holt 1980(4)	Alcohol intoxication	Physician Assessment	Patients attending A&E	A&E	Mar 1979 - Nov 1979	Scotland	NR	37	8	702
Jain 2012(5)	Alcohol intoxication	NR	Patients less than 18 years who presented to the emergency department with a decreased conscious level	A&E	Nov 2010 - Sep 2011	England	NR	NR	4	1132
Johnson 2001(6)	Alcohol intoxication Harmful use of alcohol Alcohol dependence Alcohol withdrawal state with delirium Alcohol induced psychotic disorder	ICD-10	Patients admitted to an acute psychogeriatiric unit	Mental health inpatient unit	Dec 1997 - Apr 1999	England	NR	NR	9	149
Locker 2007(7)	Alcohol intoxication	NR	Patients attending A&E and a minor injury unit	A&E	Jan 2003 - Dec 2003	England	NR	46·2	7	75141
Lockhart 1986(8)	Alcohol intoxication Harmful use of alcohol Alcohol withdrawal state Alcoholic hepatitis Alcoholic liver disease, unspecified	NR ≥ 5 Brief MAST NR NR NR	Patients with an emergency admission to a general medical firm	General medical or surgical ward	Nov 1983 and Jun 1984	England	NR	NR	8	104
Mehta 2006(9)	Alcohol intoxication Alcohol withdrawal state Alcohol amnestic disorder Alcoholic Liver Disease, Unspecified	ICD-10	Inpatients aged > 60 years referred to the alcohol liaison nurse	General medical or surgical ward	Apr 1998 - Mar 2003	England	NR	32·7	7	193
Rainer 1996(10)	Alcohol intoxication	ICD-9	Patients admitted to an A&E observation ward	General medical or surgical ward	Jan 1992 - Dec 1992	Scotland	34	75	9	2460

Trevett 1990(11)	Alcohol intoxication Harmful use of alcohol	Blood alcohol level > 17·4 mmol/l ≥ 5 MAST	Patients attending A&E	General medical or surgical ward	Dec 1988 - Mar 1989	Scotland	NR	0	6	522
Vardy 2016(12)	Alcohol intoxication Alcohol dependence	ICD-10	Patients admitted to A&E	A&E	Sep 2012 - Dec 2012	Scotland	54·1	48·9	9	5497
Wilkinson 1984(13)	Alcohol intoxication Alcohol dependence	NR	Patients with a diagnosis of schizophrenia admitted to psychiatric hospital with parasuicide	Mental health inpatient unit	1968 - 1981	Scotland	NR	48·7	4	343
Zisman 2015(14)	Alcohol intoxication	Used either a breathalyser or blood alcohol content	Patients admitted under Section 136 of the Mental Health Act	Mental health inpatient unit	Feb 2012 - Jul 2012	England	NR	43·2	8	245
Ball 2011(15)	Harmful use of alcohol Alcohol dependence	≥ 8 & < 20 AUDIT ≥ 20 AUDIT	Medical patients	General medical or surgical ward	Jan 2010 - Mar 2010	England	70	NR	8	188
Barnaby 2003(16)	Harmful use of alcohol Alcohol dependence	≥ 8 & < 15 AUDIT ≥ 15 AUDIT	Patients newly admitted to six acute psychiatric wards	Mental health inpatient unit	NR	England	41	47	7	200
Barr 2004(17)	Harmful use of alcohol	NR	Patients presenting to A&E with deliberate self-harm for the first time	A&E	1996 - 2000	Wales	NR	34·52	4	2417
Burke 1976a(18)	Harmful use of alcohol	NR	Patients admitted for intentional self-poisoning whom were Irish	General medical or surgical ward	Jan 1969 - Dec 1972	England	NR	NR	2	258
Burke 1976b(18)	Harmful use of alcohol	NR	Patients admitted for intentional self-poisoning whom were Asian	General medical or surgical ward	Jan 1969 - Dec 1972	England	NR	NR	1	52
Cameron 2006(19)	Harmful use of alcohol	> 5 MAST	Patients admitted to the medical receiving unit	General medical or surgical ward	Dec 2002 - Mar 2003	Scotland	NR	49·2	8	850
Canning 1999(20)	Harmful use of alcohol	≥ 8 AUDIT or Physician Assessment	Patients admitted to medicine	General medical or surgical ward	Jan 1995 - Jan 1997	England	NR	47·9	8	2988
Chalmers 2009(21)	Harmful use of alcohol	NR	Patients admitted with a primary diagnosis of community acquired pneumonia	General medical or surgical ward	Jan 2005 - Jan 2008	Scotland	66	51·8	5	1269
Cherry 2016(22)	Harmful use of alcohol Alcohol dependence	AUDIT-C	Patients over 18 attending A&E	A&E	NR	Northern Ireland	NR	NR	7	1114

Chick 1991(23)	Harmful use of alcohol	≥ 2 study specific questionnaire	Patients admitted to an acute male orthopaedic ward	General medical or surgical ward	Sep 1987 - Nov 1987	Scotland	NR	0	3	369
Craig 2011(24)	Harmful use of alcohol	An excess of 56 units/week for men, and 42 units/week for women	Patients with paracetamol induced hepatotoxicity admitted to the Scottish liver transplant unit	General medical or surgical ward	Nov 1992 - Oct 2008	Scotland	NR	52·5	4	581
Dolman 2005(25)	Harmful use of alcohol	≥ 8 AUDIT	Patients admitted to the acute medical ward	General medical or surgical ward	NR	Wales	61·7	50·7	8	874
Donoghue 2017(26)	Harmful use of alcohol	≥ 3 AUDIT- C	Patients attending A&E aged 10-17	A&E	Dec 2012 - May 2015	England	13·28	46·2	6	5576
Drummond 2014(27)	Harmful use of alcohol	M-SASQ, FAST or SIPS-PAT	Patients attending A&E	A&E	Mar 2008 - Apr 2009	England	NR	NR	8	5899
Dunn 2003(28)	Harmful use of alcohol	NR	Patients attending A&E with a closed head injury	A&E	Jul 1996 - Dec 2000	Scotland	NR	NR	5	24927
Gwaspari 2011(29)	Harmful use of alcohol Alcohol dependence	≥ 8 & < 16 AUDIT ≥ 16 AUDIT	African or Caribbean patients admitted to psychiatric hospital with a psychotic disorder	Mental health inpatient unit	Sep 2008 - May 2009	England	NR	NR	2	79
Hawton 1993(30)	Harmful use of alcohol	NR	Patients aged 15-24 years admitted to the regional poisoning centre because of self-poisoning or self-injury	General medical or surgical ward	1968 - 1985	Scotland	NR	NR	3	140
Hawton 2008(31)	Harmful use of alcohol	Drinking > nationally recommended adult maximum weekly limits	Patients under 15 years old presenting with deliberate self-harm	General medical or surgical ward	Jan 1978 - Dec 2003	England	NR	86·8	2	404
Hodgins 2007(32)	Harmful use of alcohol Alcohol dependence	≥ 8 & < 16 AUDIT: ♂ ≥ 6 & < 16 AUDIT: ♀ ≥ 16 AUDIT	Psychiatric inpatients with severe mental illness	Mental health inpatient unit	Jul 2004 - Apr 2005	England	38·4	41·4	5	205
Howell 2016(33)	Harmful use of alcohol	NR	Inpatients with suspected bone, native joint or soft tissue infection	General medical or surgical ward	2012	England	43	41·7	5	169
Jarman 1979(34)	Harmful use of alcohol	≥ 5 semi-structured drinking questionnaire(35)	Patients admitted to a general medical or orthopaedic ward or attending A&E	General medical or surgical ward		England	NR	46·9	4	303

Knightly 2016(36)	Harmful use of alcohol	≥ 5 MAST-G	Inpatients aged 65 or over admitted to the acute medical unit	General medical or surgical ward	NR	England	79	61	6	100
Kouimtsidis 2003(37)	Harmful use of alcohol	≥ 8 AUDIT	Patients admitted to the general hospital	General medical or surgical ward	2000	England	53·2	56	8	264
Lennox 1979(38)	Harmful use of alcohol	MAST or Physician Assessment	Patients admitted to the general medical unit	General medical or surgical ward	Jan 1977 - Mar 1977	Scotland	NR	100	6	328
Lockhart 1987a(39)	Harmful use of alcohol	NR	Patients admitted for self-poisoning	General medical or surgical ward	Nov 1971 - Feb 1972	England	NR	NR	5	84
Lockhart 1987b(39)	Harmful use of alcohol	NR	Patients admitted for self-poisoning	General medical or surgical ward	Sep 1983 - Jun 1984	England	NR	NR	5	87
Lumsden 1998(40)	Harmful use of alcohol	A note of alcohol being a significant factor in the patient's presentation, with validation from independent sources	Patients admitted to a high security hospital	Mental health inpatient unit	Nov 1990 - Aug 1992	England	31·3	0	5	100
Luttrell 1997(41)	Harmful use of alcohol	≥ 5 MAST-G	Patients admitted as an emergency to two acute admission wards aged > 65 years	General medical or surgical ward	NR	England	78	57	7	162
MacKenzie 1996(42)	Harmful use of alcohol	≥ 8 AUDIT	Patients admitted to the acute medical receiving ward	General medical or surgical ward	Feb 1995 - May 1995	Scotland	NR	NR	5	239
Mangion 1992(43)	Harmful use of alcohol	Alcohol intake greater than 21 units/ week for men and 14 units/week for women and/or; ≥ 2 CAGE and/or; Elevated GGT (>41 IU/1) or MCV (> 98 fl) levels, where corroboration from informants revealed an excessive alcohol intake	Patients admitted to medicine	General medical or surgical ward	NR	England	77·3	49	8	530
Martin 1983(44)	Harmful use of alcohol	MAST and Physician Assessment	Patents admitted to the medical unit	General medical or surgical ward	Dec 1981 - Mar 1982	Scotland	NR	0	6	528

McCloud 2004(45)	Harmful use of alcohol Alcohol dependence	≥ 8 AUDIT ≥ 16 AUDIT	Patients admitted to psychiatric hospital	Mental health inpatient unit	Nov 2001 - Jun 2002	England	NR	47·2	8	199
McCusker 2002(46)	Harmful use of alcohol	AUDIT	Patients admitted to general medicine	General medical or surgical ward	Jun 1997 - Feb 1998	England	56	49·5	7	103
McPeake 2015(47)	Harmful use of alcohol Alcohol dependence	ICD-10	Patients admitted to ICU	ICU	Jun 2012 - Dec 2013	Scotland	57	NR	9	580
McQueen 2015(48)	Harmful use of alcohol Alcohol dependence	≥ 3 & < 13 FAST ≥ 13 FAST	Patients admitted to medical and orthopaedic wards	General medical or surgical ward	NR	Scotland	NR	NR	6	2398
Morgan 1975(49)	Harmful use of alcohol Alcohol dependence Alcohol induced psychotic disorder	Interviews with patients and the hospital notes	Patients attending A&E following deliberate self-harm	A&E	1972	England	NR	66·2	7	337
Muzaimi 2010(50)	Harmful use of alcohol	NR	Patients admitted to the stroke rehabilitation unit aged 15 - 45	General medical or surgical ward	Jan 2003 - Jan 2009	Wales	37·2	47·6	4	21
Ninkovic 2012(51)	Harmful use of alcohol Alcohol dependence	≥ 8 & < 20 AUDIT ≥ 20 AUDIT	Inpatients	General medical or surgical ward	NR	England	69	NR	8	380
Oude Voshaar 2011(52)	Harmful use of alcohol	NR	Patients presenting to A&E as a result of deliberate self-harm	A&E	Sep 1997 - Aug 2007	England	48·2	50·4	7	2217
Poole 2014(53)	Harmful use of alcohol	NR	Inpatients experiencing delayed discharge from a mental health hospital	Mental health inpatient unit	Oct 2009 and Jan 2010	England	48·1	50	4	79
Sangha 2015(54)	Harmful use of alcohol	NR	Patients admitted with stroke	General medical or surgical ward	Jan 2000 - Dec 2007	England	71·5	47·5	7	4804
Sharkey 1996a(55)	Harmful use of alcohol	≥ 8 AUDIT	Inpatients	General medical or surgical ward	Nov 1994 -	Northern Ireland	56	58	8	136
Sharkey 1996b(55)	Harmful use of alcohol	≥ 8 AUDIT	Patients attending A&E	A&E	Nov 1994 -	Northern Ireland	36	43	8	104
Sinclair 2008(56)	Harmful use of alcohol Alcohol dependence	≥ 8 & < 15 AUDIT ≥ 15 AUDIT	Patients admitted to the acute adult wards of a psychiatric hospital	Mental health inpatient unit	Jul 2005 - Oct 2005	England	NR	NR	8	178
Taylor 1986(57)	Harmful use of alcohol	≥ 6 Brief MAST	Patients admitted as an emergency to medical and surgical wards	General medical or surgical ward	Oct 1984 - Jan 1985	England	NR	NR	7	1628

Taylor 1998(58)	Harmful use of alcohol	NR	Inpatients in the special hospitals (i·e· high security patients with mental disorders)	Mental health inpatient unit	Jan 1993 - Jun 1993	England	39	17	7	1740
Thom 1999(59)	Harmful use of alcohol	≥ 8 AUDIT	Patients attending A&E	A&E	Mar 1996 - May 1996	England	NR	46·8	8	679
Alavi 2016(60)	Alcohol dependence	NR	Patients with hepatitis C virus related liver disease admitted with decompensated cirrhosis	General medical or surgical ward	2001 - 2014	Scotland	NR	NR	4	1222
Barrison 1982(61)	Alcohol dependence	≥ 2 CAGE or Consumption Index	Inpatients except paediatric, geriatric or two surgical wards	General medical or surgical ward	Sep 1980 and Dec 1980	England	NR	NR	7	520
Ben-Shlomo 1992(62)	Alcohol dependence	≥ 2 CAGE	Patients admitted to three adjoining hospitals	General medical or surgical ward	NR	England	NR	NR	5	105
Bernadt 1986(63)	Alcohol dependence	25 questions relating to alcohol consumption	Patients admitted to psychiatric hospital	Mental health inpatient unit	Feb 1980 - Nov 1980	England	NR	50·1	7	371
Bruce 2014(64)	Alcohol dependence	≥ 16 AUDIT	Patients with serious mental illness of black Caribbean, black African, and white British ethnicity	Mental health inpatient unit	Sep 2008 - Jul 2010	England	37·4	0	3	165
Carney 1995(65)	Alcohol dependence	ICD-9	Patients admitted to psychiatric hospital	Mental health inpatient unit	Jun 1987 - Jun 1990	England	NR	54	9	1048
Corbbett 1998a(66)	Alcohol dependence	Consultant diagnosis	Caucasian patients with schizophrenia convicted of serious offences	Mental health inpatient unit	1972 - 1995	England	NR	NR	5	1111
Corbbett 1998b(66)	Alcohol dependence	Consultant diagnosis	Caucasian patients with personality disorders convicted of serious offences	Mental health inpatient unit	1972 - 1995	England	NR	NR	5	885
Feldman 1986(67)	Alcohol dependence	≥ 2 CAGE	Patients admitted to three general medical firms	General medical or surgical ward	Oct 1983 - Dec 1983	England	NR	NR	8	382
Forrest 1973(68)	Alcohol dependence	NR	Patients admitted to the regional poisoning treatment centre having taken lysergide	General medical or surgical ward	Jan 1971 - Jul 1973	Scotland	20	33·3	4	60
Franklin 1977(69)	Alcohol dependence	NR	Doctors admitted to a private psychiatric hospital	Mental health inpatient unit	Jan 1965 - Dec 1974	England	NR	NR	3	100

Glass 1988(70)	Alcohol dependence Alcohol induced psychotic disorder	ICD-8	Patients admitted to psychiatric hospital	Mental health inpatient unit	1970-1981	England	NR	NR	9	43552
Hall 1995(71)	Alcohol dependence	NR	Patients detained under section 5(2) of the Mental Health Act in psychiatric hospital	Psychiatric Hospital	Apr 1992 - Mar 1993	England	NR	57	4	61
Hamlyn 1978(72)	Alcohol dependence	NR	Patients admitted to hospital with paracetamol overdose	General medical or surgical ward	Nov 1974 - Nov 1975	England	NR	NR	6	201
Herzberg 1987(73)	Alcohol dependence Alcoholic gastritis	NR	Patients admitted to psychiatric hospital who were homeless upon admission	Mental health inpatient unit	1971 - 1980	England	NR	22·6	6	110
Holmes 2010(74)	Alcohol dependence	NR	All patients admitted with burns to a regional burns centre	General medical or surgical ward	2003 - 2008	England	NR	NR	5	1293
Kelleher 1975(75)	Alcohol dependence Alcohol withdrawal state with delirium Alcohol induced psychotic disorder	NR	Patients admitted to psychiatric hospital	Mental health inpatient unit	NR	England	NR	NR	4	174
Laugharne 1997(76)	Alcohol dependence	ICD-10	Inpatients referred to liaison psychiatry	General medical or surgical ward	NR	England	NR	NR	9	94
MacIntyre 1979(77)	Alcohol dependence Alcohol withdrawal state with delirium Alcoholic cirrhosis of liver Alcoholic polyneuropathy	MAST	Patients admitted as emergencies to a general medical ward	General medical or surgical ward	1977	Scotland	NR	0	5	301
Maguire 1974(78)	Alcohol dependence	NR	Patients admitted to two medical wards	General medical or surgical ward	Nov 1971 - Dec 1971	England	NR	52·1	7	230
Mangan 1994(79)	Alcohol dependence	≥ 2 CAGE	Inpatient in a rural hospital	General medical or surgical ward	Mar 1993 -	Northern Ireland	NR	59·3	5	91
Merrill 1986(80)	Alcohol dependence	NR	Patients admitted following deliberate self-poisoning	General medical or surgical ward	Jan 1979 - Dec 1981	England	30·3	63	7	1160

Merrill 1992(81)	Alcohol dependence	NR	English-born patients whom had attempted suicide admitted to the West Midlands Poisons Unit	General medical or surgical ward	Apr 1988 -	England	33·4	59·2	5	250
Orford 1992(82)	Alcohol dependence	≥ 2 CAGE	Patients who were acute admissions to medical wards	General medical or surgical ward	NR	England	56·6	39·1	8	546
Peters 2002(83)	Alcohol dependence	≥ 2 CAGE	Patients attending A&E	A&E	Oct 1995 - Mar 1996	England	NR	NR	5	3381
Platt 1991(84)	Alcohol dependence	NR	Patients presenting with parasuicide treated at the regional poisoning treatment centre	General medical or surgical ward	1968 - 1987	Scotland	NR	58·7	7	5120
Saxena 2000(85)	Alcohol dependence	ICD-10	Patients admitted to hospital	General medical or surgical ward	Apr 1992 - Sep 1998	England	NR	NR	6	530
Schoepf 2015(86)	Alcohol dependence Alcoholic gastritis Alcoholic hepatic failure Alcoholic liver disease, unspecified Alcohol-induced acute pancreatitis Alcohol-induced chronic pancreatitis	ICD-10	Patients admitted to hospital	General medical or surgical ward	Jan 2000 - Jun 2012	England	NR	NR	9	929456
Van der Pol 1996(87)	Alcohol dependence	CAGE	Patients attending A&E	A&E	NR	England	77	74·2	6	105
Husain 2013(88)	Alcohol dependence Alcohol withdrawal state Alcoholic liver disease, unspecified	Examination of the case notes	Patients admitted to medicine	General medical or surgical ward	Jan 2010 - Dec 2011	England	NR	NR	7	48200
Dowey 1993(89)	Alcohol withdrawal state with delirium	NR	Patients attending A&E	A&E	NR	Northern Ireland	NR	48·8	6	6625
Ramakrishna 2012(90)	Alcohol induced amnestic disorder	ICD-10	Inpatients with acquired brain injury in the medium and low secure neurorehabilitation units	Mental health inpatient unit	Aug 2011 -	England	41·2	0	6	43
Clark 2011(91)	Intentional self-poisoning by and exposure to alcohol	NR	All patients admitted to ICU	ICU	Jan 2005 - Dec 2009	Scotland	NR	NR	7	12702
Poisoning due to alcohol										

Lawson 1983(92)	Poisoning by and exposure to alcohol, undetermined intent	NR	All patients admitted to hospital under the aged 10- 15 with a diagnosis of poisoning	General medical or surgical ward	1974 - 1981	England	NR	NR	5	417
Liver disorders due to alcohol K70·x										
Bretherick 2011(93)	Alcoholic hepatitis	NR	Patients admitted to the Scottish liver transplant unit	General medical or surgical ward	Nov 1992 - Mar 2009	Scotland	38·1	NR	5	949
Johnston 1991(94)	Alcoholic fibrosis and sclerosis of liver	NR	Patients admitted with Child's Class C liver disease with acute variceal bleeding	General medical or surgical ward	Jan 1980 - Dec 1989	Northern Ireland	55	45·1	5	102
Ahmadnia 2015(95)	Alcoholic cirrhosis of liver	NR	Patients with decompensated chronic liver disease	ICU	Jan 2012 - Dec 2013	England	57	38	3	37
Berry 2012(96)	Alcoholic cirrhosis of liver Alcoholic hepatitis	NR	Patients admitted with decompensated cirrhosis	General medical or surgical ward	Nov 2010 - Nov 2011	England	NR	NR	6	66
Cole 2016(97)	Alcoholic cirrhosis of liver	NR	Patients discharged from the hepatology ward	General medical or surgical ward	Jan 2013 - Dec 2013	Scotland	56	34·8	4	198
Dyson 2016(98)	Alcoholic cirrhosis of liver	NR	Patients with decompensated cirrhosis	General medical or surgical ward	Nov 2013 - Mar 2014	England	53	41	2	228
Emerson 2014(99)	Alcoholic cirrhosis of liver	NR	Patients admitted to ICU with cirrhosis	ICU	Jun 2012 - May 2013	Scotland	51	32	4	59
Hampshire 2014(100)	Alcoholic cirrhosis of liver	NR	Patients admitted to ICU	ICU	Jul 2003 - Sep 2011	England	NR	NR	7	4178
Lloyd-Evans 2015(101)	Alcoholic cirrhosis of liver	NR	Patients admitted to critical care	ICU	2009 - 2014	Wales	NR	·	6	5394
Musumba 2013(102)	Alcoholic cirrhosis of liver	NR	Patients admitted to ICU	ICU	Jul 2003 - Sep 2011	England	NR	NR	7	4178
Shawcross 2012(103)	Alcoholic cirrhosis of liver Alcoholic hepatitis	NR	Patients admitted to a liver ICU with cirrhosis and organ dysfunction	ICU	Jan 2000 - Jun 2007	England	NR	NR	7	563
Thomson 2010(104)	Alcoholic cirrhosis of liver	NR	Patients admitted to ICU	ICU	Oct 2007 - Jul 2009	England	NR	NR	7	4198
Al-Freah 2010(105)	Alcoholic Liver Disease, Unspecified	NR	Patients admitted to the liver intensive therapy unit with severe upper gastrointestinal variceal bleeding	ICU	Jan 2000 - Mar 2008	England	49	42·7	8	157

Bugeja 2012(106)	Alcoholic Liver Disease, Unspecified	NR	Patients diagnosed with spontaneous bacterial peritonitis whom were admitted with ascites to the liver unit	General medical or surgical ward	2009	England	NR	NR	3	26
Burke 2017(107)	Alcoholic Liver Disease, Unspecified	NR	Patients with decompensated chronic liver disease	General medical or surgical ward	Apr 2014 - Jun 2015	England	NR	NR	3	117
Butler 2001(108)	Alcoholic Liver Disease, Unspecified Alcohol withdrawal state	NR	Patients admitted to the acute medical receiving unit	General medical or surgical ward	NR	Scotland	NR	NR	7	360
Corbett 2012(109)	Alcoholic Liver Disease, Unspecified	NR	Patients with a history of variceal bleeding admitted to an intensive care unit	ICU	NR	England	53·7	NR	3	41
Davies 1992(110)	Alcoholic Liver Disease, Unspecified	NR	Patients admitted with liver disease	General medical or surgical ward	Jan 1987 - Dec 1989	Wales	NR	NR	4	74
Docking 2014(111)	Alcoholic Liver Disease, Unspecified	NR	Patients admitted to the intensive care unit	ICU	Oct 2008 - Nov 2010	Scotland	NR	39·8	7	1029
Dsouza 2015(112)	Alcoholic Liver Disease, Unspecified	NR	Patients admitted for a liver transplant assessment	General medical or surgical ward	Feb 2012 - Mar 2013	England	NR	NR	6	109
Hislop 2004(113)	Alcoholic Liver Disease, Unspecified	NR	Inpatients in general medical and gastroenterology wards	General medical or surgical ward	2000 - 2001	Scotland	NR	51·5	6	1637
Lewis 2003(114)	Alcoholic Liver Disease, Unspecified	NR	Patients who received liver transplants	General medical or surgical ward	Sep 1990 - Aug 2000	England	46·9	40	7	627
McPhail 2018(115)	Alcoholic Liver Disease, Unspecified	ARLD was identified where primary, secondary, or ultimate primary reason for admission was either alcohol withdrawal seizures, alcoholic cirrhosis, acute alcoholic hepatitis, alcohol-induced chronic pancreatitis, self-poisoning with alcohol, alcohol overdose,	Patients with cirrhosis admitted to ICU	ICU	Jan 1998 - Dec 2012	United Kingdom (constituent nation prevalence not reported)	52·7	38·5	8	31363

		delirium tremens or alcohol dependence								
Welch 2008(116)	Alcoholic Liver Disease, Unspecified	NR	Patients admitted to ICU	ICU	Dec 1995 - July 2005	United Kingdom (constituent nation prevalence not reported)	NR	NR	7	385429
Gastrointestinal disorders due to alcohol										
Ellis 2009(117)	Alcohol-induced acute pancreatitis	Information in the clinical records	Patients admitted with acute pancreatitis	General medical or surgical ward	Sep 2006 - Mar 2007	England	57	47·4	5	963
Giggs 1998(118)	Alcohol-induced acute pancreatitis	NR	Patients admitted with primary acute pancreatitis	General medical or surgical ward	1969 - 1983	England	NR	54·2	4	498
Imrie 1975(119)	Alcohol-induced acute pancreatitis	NR	Patients admitted with acute pancreatitis	General medical or surgical ward	1971 - 1972	Scotland	NR	53·8	6	78
Lowham 1999(120)	Alcohol-induced acute pancreatitis	NR	Patients admitted with a diagnosis of acute pancreatitis	General medical or surgical ward	Jan 1996 - Dec 1997	England	62·3	46·7	7	105
O'Reilly 2017(121)	Alcohol-induced acute pancreatitis	NR	Patients admitted with severe acute pancreatitis	General medical or surgical ward	Jan 2014 - Jun 2014	United Kingdom (constituent Nation prevalence not reported)	NR	NR	6	692
Pavlidis 2012(122)	Alcohol-induced acute pancreatitis	NR	Patients with severe acute pancreatitis admitted to ICU	ICU	Jan 2005 - Dec 2010	England	NR	NR	4	50
Read 1976(123)	Alcohol-induced acute pancreatitis Alcohol-induced	NR	Patients admitted with exocrine pancreatic	General medical or	1968 - 1974	England	NR	46·2	7	119

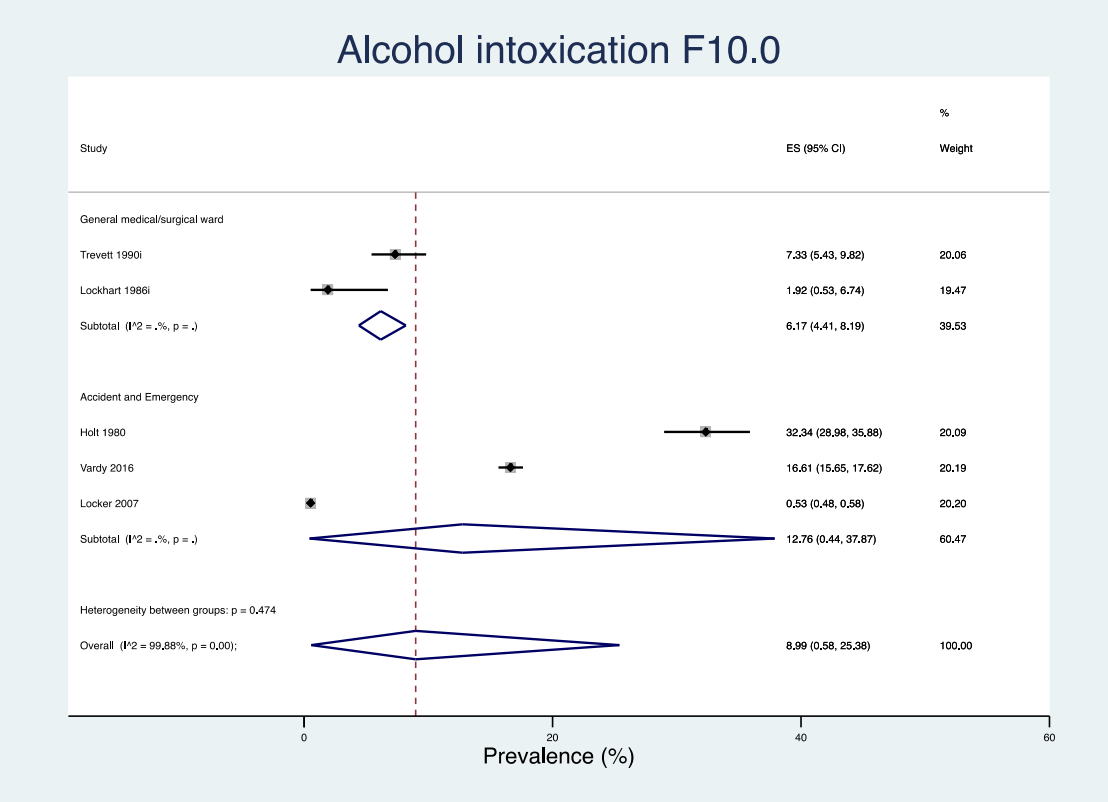
	chronic pancreatitis		disease	surgical ward						
Toh 2000(124)	Alcohol-induced acute pancreatitis	NR	Patients admitted with acute pancreatitis	General medical or surgical ward	Dec 1994 - Nov 1995	England	54·3	43	7	186
Howat 1968(125)	Alcohol-induced chronic pancreatitis	NR	Patients admitted with chronic pancreatitis	General medical or surgical ward	NR	England	NR	51·9	3	54
Other disorders due to alcohol										
Peters 1985(126)	Alcoholic myopathy	Quadriceps muscle biopsy	Patients admitted to a district general hospital for assessment and alcohol re-education	General medical or surgical ward	NR	England	47	30·4	6	151

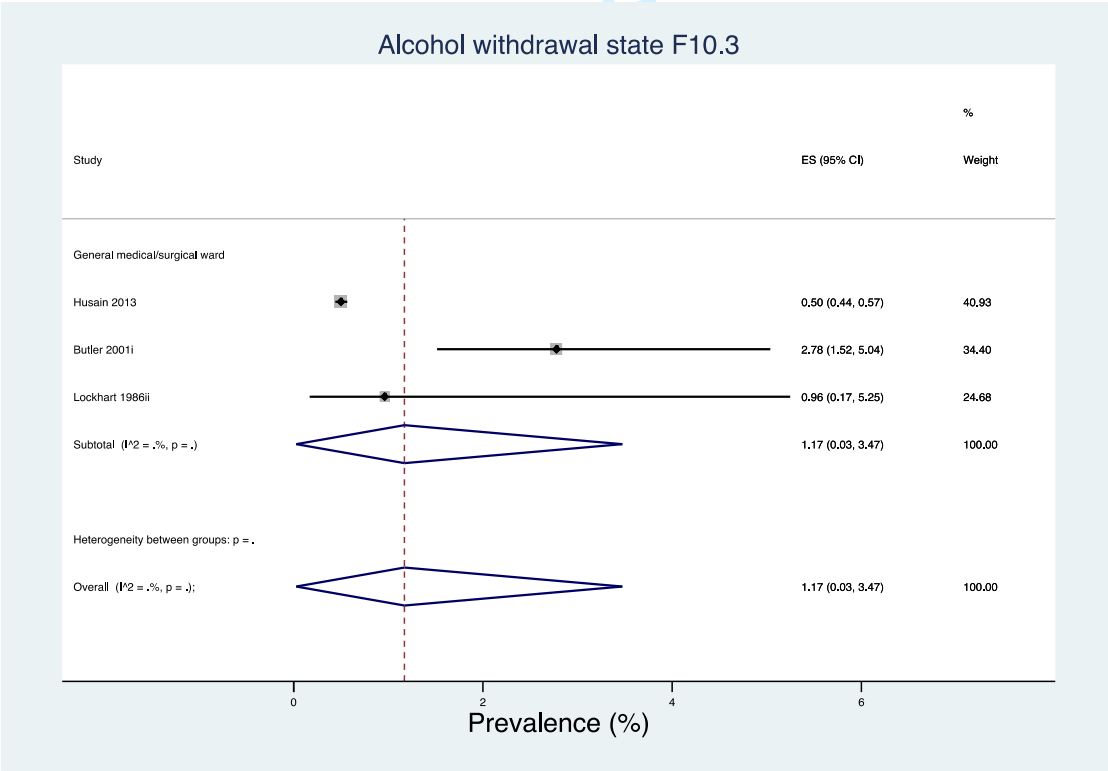
NR=Not reported; NOS=Newcatsle-Ottawa Scale; ICD=International Classification of Disease; DSM=Diagnostic and Statistical Manual of Mental Disorders; A&E=Accident and Emergency; ICU=In tensive Care Unit; AUDIT= Alcohol Use Disorders Identification Test; CAGE=CAGE Questionnaire; MAST= Michigan Alcohol Screening Test; M-SASQ=Modified Single Alcohol Screening Question; FAST=Fast Alcohol Screening Test; SIPS-PAT=Screening and Intervention Programme for Sensible drinking Paddington Alcohol Test; MCV=Mean Corpuscular Volume; GGT=Gamma-Glutamyl Transferase; ARLD=Alcohol Related Liver Disease

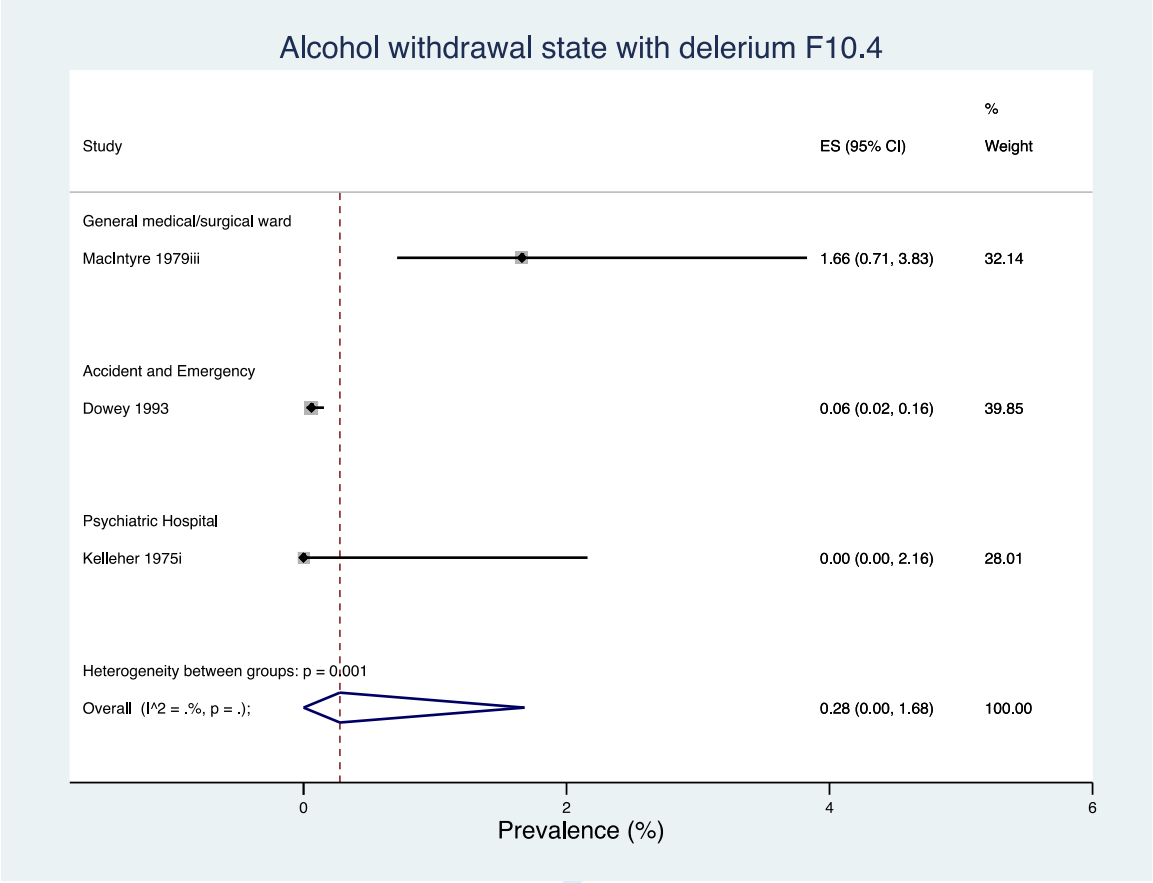
Table S3: GRADE clinical evidence profile for overall prevalence estimates in non-selective patients

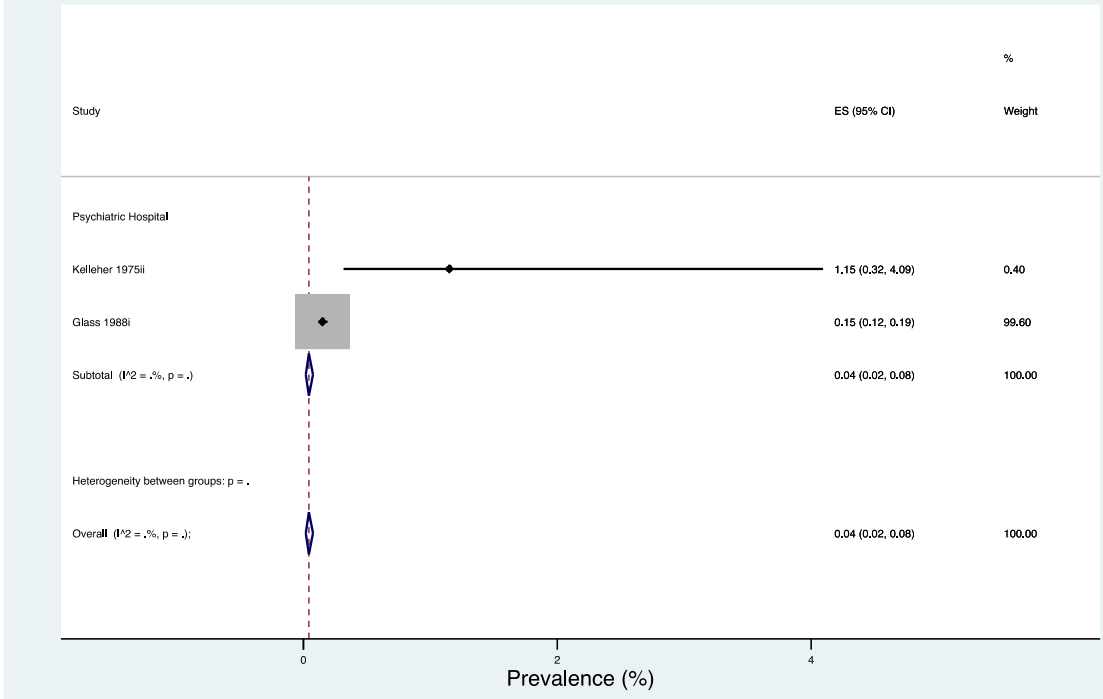
Quality Assessment						Prevalence % (95% CI)	Quality
No of prevalence estimates	Risk of bias	Inconsistency	Indirectness	Imprecision	Publication Bias		
Alcohol intoxication F10.0							
5	None	Very Serious	None	Very Serious	N/A	8.99 (0.58 -25.38)	VERY LOW
Harmful use of alcohol F10.1							
29	None	Very Serious	None	None	None	19.76 (15.61 - 24.26)	VERY LOW
Alcohol dependence F10.2							
23	None	Very Serious	None	None	None	10.25 (7.06 - 13.96)	VERY LOW
Alcohol withdrawal state F10.3							
3	None	Very Serious	None	None	N/A	1.17 (0.03 - 3.47)	VERY LOW
Alcohol withdrawal state with delirium F10.4							
3	Serious	Very Serious	None	None	N/A	0.28 (0.00 - 1.68)	VERY LOW
Alcohol induced psychotic disorder F10.5							
2	Serious	N/A	None	None	N/A	0.04 (0.02 - 0.08)	VERY LOW
Intentional self-poisoning by and exposure to alcohol X65							
1	None	N/A	None	None	N/A	1.54 (1.34 - 1.76)	LOW
Alcoholic hepatitis K70.1							
1	None	N/A	None	None	N/A	0.96 (0.17 - 5.25)	LOW
Alcoholic cirrhosis of liver K70.3							
5	Serious	Very Serious	None	None	N/A	2.23 (1.77 - 2.74)	VERY LOW
Alcoholic hepatic failure K70.4							
1	Serious	N/A	None	None	N/A	0.22 (0.20 - 0.24)	VERY LOW
Alcoholic liver disease, unspecified K70.9							
5	Serious	Very Serious	None	None	N/A	2.01 (1.52 - 2.56)	VERY LOW
Alcohol-induced acute pancreatitis K85.2							
1	Serious	N/A	None	None	N/A	0.41 (0.39 - 0.44)	VERY LOW
Alcohol-induced chronic pancreatitis K86.0							
1	Serious	N/A	None	None	N/A	0.41 (0.39 - 0.44)	VERY LOW
Alcoholic gastritis K29.2							
1	Serious	N/A	None	None	N/A	2.15 (2.09 - 2.20)	VERY LOW
Alcoholic polyneuropathy G62.1							
1	Serious	N/A	None	None	N/A	1.00 (0.34 - 2.89)	VERY LOW

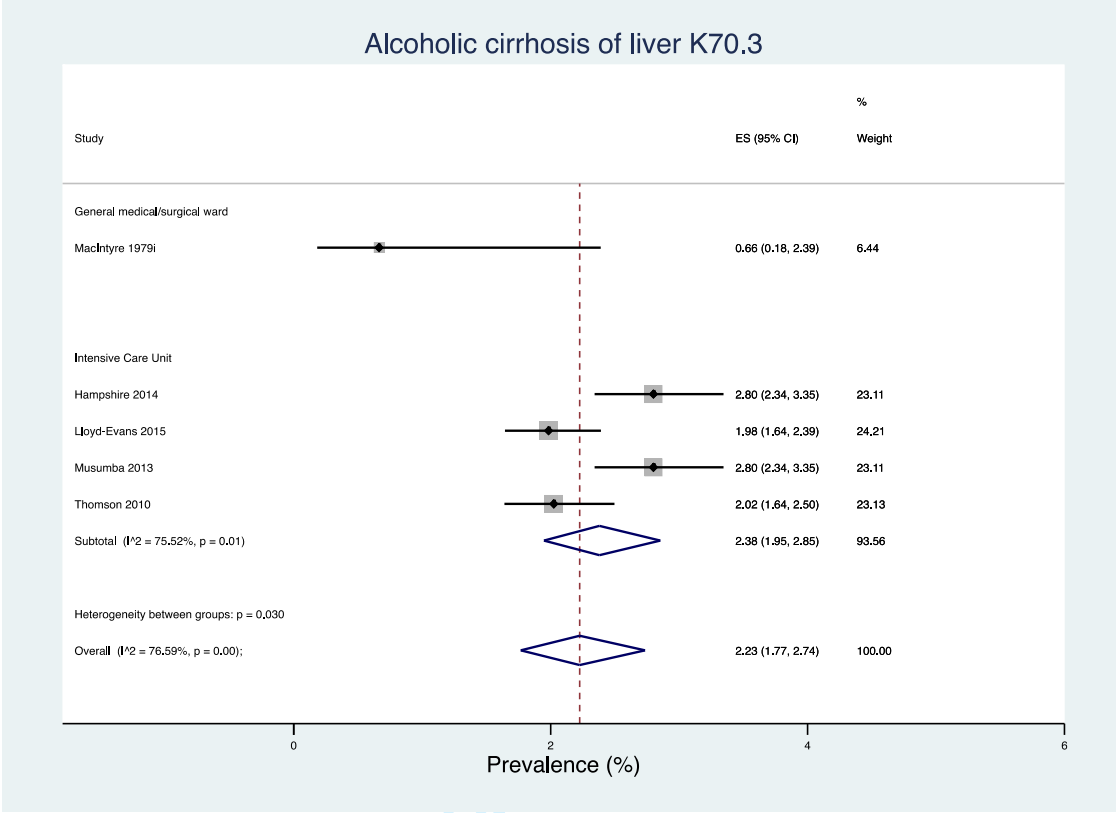
Figure S8: Forest plots of meta-analysis for pooled prevalence of wholly attributable alcohol conditions in non-selective patients in the UK hospital system






Alcohol withdrawal state with delerium F10.4
Study
ES (95% CI)
%
Weight
General medical/surgical ward
MacIntyre 1979iii
1.66 (0.71, 3.83)
32.14
Accident and Emergency
Dowey 1993
0.06 (0.02, 0.16)
39.85
Psychiatric Hospital
Kelleher 1975i
0.00 (0.00, 2.16)
28.01
Heterogeneity between groups: p = 0.001
Overall (I^2 = .%, p = .);
0.28 (0.00, 1.68)
100.00
0
2
4
6
Prevalence (%)


Alcohol induced psychotic disorder F10.5
Study
ES (95% CI)
%
Weight
Psychiatric Hospital
Kelleher 1975ii
1.15 (0.32, 4.09)
0.40
Glass 1988i
0.15 (0.12, 0.19)
99.60
Subtotal (I^2 = .%, p = .)
0.04 (0.02, 0.08)
100.00
Heterogeneity between groups: p = .
Overall (I^2 = .%, p = .);
0.04 (0.02, 0.08)
100.00
0
2
4
Prevalence (%)


Alcoholic cirrhosis of liver K70.3
Study
ES (95% CI)
%
Weight
General medical/surgical ward
MacIntyre 1979i
0.66 (0.18, 2.39)
6.44
Intensive Care Unit
Hampshire 2014
2.80 (2.34, 3.35)
23.11
Lloyd-Evans 2015
1.98 (1.64, 2.39)
24.21
Musumba 2013
2.80 (2.34, 3.35)
23.11
Thomson 2010
2.02 (1.64, 2.50)
23.13
Subtotal (I^2 = 75.52%, p = 0.01)
2.38 (1.95, 2.85)
93.56
Heterogeneity between groups: p = 0.030
Overall (I^2 = 76.59%, p = 0.00);
2.23 (1.77, 2.74)
100.00
0
2
4
6
Prevalence (%)

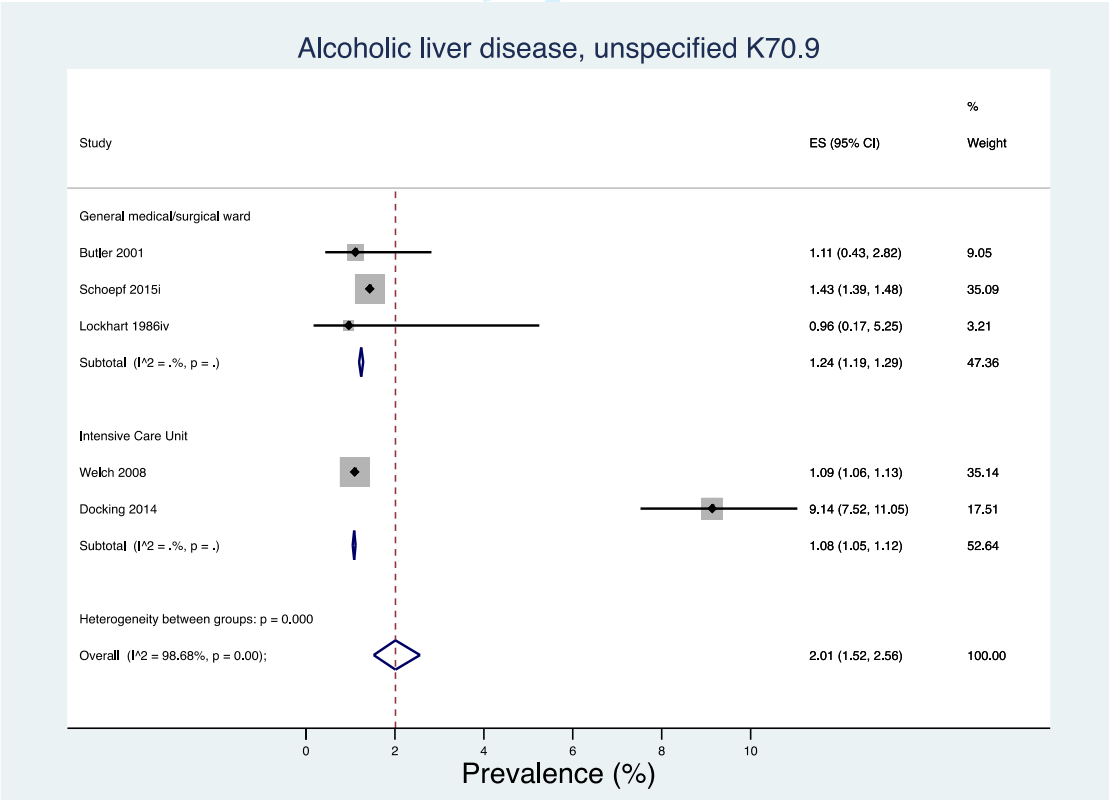

Alcoholic liver disease, unspecified K70.9
Study
ES (95% CI)
%
Weight
General medical/surgical ward
Butler 2001
1.11 (0.43, 2.82)
9.05
Schoepf 2015i
1.43 (1.39, 1.48)
35.09
Lockhart 1986iv
0.96 (0.17, 5.25)
3.21
Subtotal (I^2 = .%, p = .)
1.24 (1.19, 1.29)
47.36
Intensive Care Unit
Welch 2008
1.09 (1.06, 1.13)
35.14
Docking 2014
9.14 (7.52, 11.05)
17.51
Subtotal (I^2 = .%, p = .)
1.08 (1.05, 1.12)
52.64
Heterogeneity between groups: p = 0.000
Overall (I^2 = 98.68%, p = 0.00);
2.01 (1.52, 2.56)
100.00
0
2
4
6
8
10
Prevalence (%)

Table S4: Pooled prevalence for wholly attributable alcohol conditions in patients with an alcohol diagnosis in the UK hospital system

Patients with an alcohol diagnosis	Patient cohort studied	Number of Prevalence Estimates (n)	Prevalence % (95% CI)
Mental and behavioural disorders due to use of alcohol (F10.x)			
Alcohol dependence F10.2	Patients with alcohol withdrawal syndrome	1	77.25 (71.14 - 82.39)*
Liver disorders due to alcohol K70.x			
Alcoholic liver disease, unspecified K70.9	Patients with alcohol withdrawal syndrome	1	21.80 (16.76 - 27.85)
Other disorders due to alcohol			
Alcoholic myopathy G72.1	Patients in a district general hospital admitted for alcohol re-education	1	59.60 (51.63 - 67.10)

All estimates were deemed *very low* quality according to GRADE unless marked by * which indicates *low* quality

Table S5: GRADE clinical evidence profile for wholly attributable alcohol conditions in patients with an alcohol diagnosis in the UK hospital system

Quality Assessment						Prevalence % (95% CI)	Quality
No of prevalence estimates	Risk of bias	Inconsistency	Indirectness	Imprecision	Publication Bias		
Alcohol dependence F10.2 in patients with alcohol withdrawal syndrome							
1	None	N/A	None	None	N/A	77.25 (71.14 - 82.39)	LOW
Alcoholic liver disease, unspecified K70.9 in patients with alcohol withdrawal syndrome							
1	None	N/A	None	Serious	N/A	21.80 (16.76 - 27.85)	VERY LOW
Alcoholic myopathy G72.1 Patients in a district general hospital admitted for alcohol re-education							
1	Serious	N/A	None	Serious	N/A	59.60 (51.63 - 67.10)	VERY LOW

Table S6: Pooled prevalence for wholly attributable alcohol conditions in patients with specific health disorders in the UK hospital system

Patients with specific health disorders			Prevalence % (95% CI)				
	Patient cohort studied	Number of Prevalence Estimates (n)	General medical or surgical ward	ICU	A&E	Mental health inpatient unit	Overall
Mental and behavioural disorders due to use of alcohol (F10.x)							
Alcohol Intoxication F10.0	Patients referred to the alcohol liaison nurse	1	17.62 (12.89 - 23.61)	-	-	-	17.62 (12.89 - 23.61)
	Patients admitted to an A&E observation ward	1	15.89 (14.50 - 17.39)	-	-	-	15.89 (14.50 - 17.39)*
	Patients who presented with a decreased conscious level	1	-	-	27.83 (25.29 - 30.51)	-	27.83 (25.29 - 30.51)
	Patients who were private vehicle occupants	1	-	-	5.75 (3.15 - 10.25)	-	5.75 (3.15 - 10.25)
	Patients with a diagnosis of schizophrenia admitted with parasuicide	1	-	-	-	8.16 (5.71 - 11.55)	8.16 (5.71 - 11.55)
	Patients admitted under Section 136 of the Mental Health Act	1	-	-	-	38.37 (32.50 - 44.59)	38.37 (32.50 - 44.59)
Harmful use of alcohol F10.1	Patients with deliberate self-harm	4	8.64 (6.39 - 11.18)	-	30.81 (29.10 - 32.55)	-	16.14 (3.07 -36.54)
	Patients with self-poisoning	2	2.50 (1.01 - 4.54)	-	-	-	2.50 (1.01 - 4.54)

	Patients with a psychotic disorder	1	-	-	-	15.19 (8.91 - 24.70)	15.19 (8.91 - 24.70)
	Patients with a severe mental illness	1	-	-	-	33.66 (27.54 - 40.38)	33.66 (27.54 - 40.38)
	Patients experiencing a delayed discharge	1	-	-	-	43.04 (32.69 - 54.03)	43.04 (32.69 - 54.03)
	Patients with a closed head injury	1	-	-	17.64 (17.17 - 18.12)	-	17.64 (17.17 - 18.12)
	Patients with suspected bone, native joint or soft tissue infection	1	-	-	11.24 (7.32 - 16.89)	-	11.24 (7.32 - 16.89)
	Patients with paracetamol induced hepatotoxicity	1	45.27 (41.26 - 49.33)	-	-	-	45.27 (41.26 - 49.33)
	Patients with stroke	1	2.27 (1.88 - 2.73)	-	-	-	2.27 (1.88 - 2.73)*
	Patients with community acquired pneumonia	1	5.52 (4.39 - 6.91)	-	-	-	5.52 (4.39 - 6.91)
Alcohol dependence F10.2	Patients who are homeless	1	-	-	-	23.64 (16.67 - 32.38)	23.64 (16.67 - 32.38)
	Patients who are doctors	1	-	-	-	20.00 (13.34 - 28.88)	20.00 (13.34 - 28.88)
	Patients with schizophrenia convicted of serious offences	1	-	-	-	2.34 (1.60 - 3.41)	2.34 (1.60 - 3.41)
	Patients with a psychotic disorder	1	-	-	-	18.99 (11.86 - 28.99)	18.99 (11.86 - 28.99)

	Patients with schizophrenia admitted with parasuicide	1	-	-	-	1.46 (0.62 - 3.37)	1.46 (0.62 - 3.37)
	Patients with serious mental illness	2	-	-	-	16.76 (13.10 - 20.76)	16.76 (13.10 - 20.76)
	Patients detained under section 5(2) of the Mental Health Act	1	-	-	-	3.28 (0.90 - 11.19)	3.28 (0.90 - 11.19)
	Patients with personality disorders convicted of serious offences	1	-	-	-	6.44 (5.00 - 8.25)	6.44 (5.00 - 8.25)
	Patients with deliberate self-harm	3	9.77 (8.99 - 10.59)	-	10.39 (7.56 - 14.10)	-	11.17 (8.35 - 14.32)
	Patients with hepatitis C virus related decompensated cirrhosis	1	50.98 (48.18 - 53.78)	-	-	-	50.98 (48.18 - 53.78)
	Patients with self-poisoning	1	6.12 (4.88 - 7.65)	-	-	-	6.12 (4.88 - 7.65)
	Patients unless they were admitted with an acute general surgical condition, a social problem, an overdose, or mental illness	1	16.19 (10.36 - 24.41)	-	-	-	16.19 (10.36 - 24.41)
	Patients whom were poisoned by lysergide	1	5.00 (1.71 - 13.70)	-	-	-	5.00 (1.71 - 13.70)
	Patients with paracetamol overdose	1	9.95 (6.53 - 14.87)	-	-	-	9.95 (6.53 - 14.87)
	Patients with burns	1	12.30 (10.62 - 14.20)	-	-	-	12.30 (10.62 - 14.20)

Alcohol withdrawal state F10.3	Patients referred to the alcohol liaison nurse	1	9.33 (5.98 - 14.26)	-	-	-	9.33 (5.98 - 14.26)*
Alcohol induced psychotic disorder F10.5	Patients with deliberate self-harm	1	-	-	8.31 (5.81 - 11.75)	-	8.31 (5.81 - 11.75)*
Alcohol induced amnestic disorder F10.6	Patients referred to the alcohol liaison nurse	1	0.52 (0.09 - 2.88)	-	-	-	0.52 (0.09 - 2.88)*
	Patients with acquired brain injury	1	-	-	-	2.33 (0.41 - 12.06)	2.33 (0.41 - 12.06)
Poisoning due to alcohol							
Poisoning by and exposure to alcohol, undetermined intent Y15	Patients with a diagnosis of poisoning	1	21.34 (17.68 - 25.53)	-	-	-	21.34 (17.68 - 25.53)
Liver disorders due to alcohol K70.x							
Alcoholic hepatitis K70.1	Patients with decompensated cirrhosis	2	36.36 (25.81 - 48.42)	7.99 (6.03 - 10.53)	-	-	9.93 (7.67 - 12.44)
	Patients admitted to a liver transplant unit	1	0.95 (0.50 - 1.79)	-	-	-	0.95 (0.50 - 1.79)
Alcoholic fibrosis and sclerosis of liver K70.2	Patients with Child's Class C liver disease with acute variceal bleeding	1	51.96 (42.37 - 61.41)	-	-	-	51.96 (42.37 - 61.41)
Alcoholic cirrhosis of liver K70.3	Patients with decompensated cirrhosis	5	84.48 (80.06 - 88.46)	67.27 (41.50 - 88.54)	-	-	74.39 (52.82 - 91.16)
Alcoholic liver disease, unspecified K70.9	Patients with chronic liver disease	3	63.44 (56.43 - 70.17)	34.87 (34.34 - 35.40)	-	-	52.70 (29.55 - 75.25)

	Patients who received liver transplants	1	17.38 (14.62 -20.55)	-	-	-	17.38 (14.62 -20.55)
	Patients with spontaneous bacterial peritonitis in those admitted with ascites	1	65.38 (46.22 - 80.59)	-	-	-	65.38 (46.22 - 80.59)
	Patients referred to the alcohol liaison nurse	1	10.88 (7.23 - 16.06)	-	-	-	10.88 (7.23 - 16.06)
	Patients admitted for a liver transplant assessment	1	33.03 (24.91 - 42.30)	-	-	-	33.03 (24.91 - 42.30)
	Patients with a history of variceal bleeding	1	-	56.10 (41.04 - 70.11)	-	-	56.10 (41.04 - 70.11)
	Patients with severe upper gastrointestinal variceal bleeding	1	-	52.87 (45.08 - 60.51)	-	-	52.87 (45.08 - 60.51)
Gastrointestinal disorders due to alcohol							
Alcohol-induced acute pancreatitis K85.2	Patients with acute pancreatitis	7	21.77 (15.67 - 28.56)	40.00 (27.61 - 53.82)	-	-	23.55 (17.39 - 30.32)
	Patients with exocrine pancreatic disease	1	6.72 (3.45 - 12.71)	-	-	-	6.72 (3.45 - 12.71)
Alcohol-induced chronic pancreatitis K86.0	Patients with chronic pancreatitis	1	20.37 (11.77 - 32.90)	-	-	-	20.37 (11.77 - 32.90)
	Patients with exocrine pancreatic disease	1	14.29 (9.11 - 21.69)	-	-	-	14.29 (9.11 - 21.69)
Alcoholic gastritis K29.2	Patients who are homeless	1	-	-	-	0.91 (0.16 - 4.97)	0.91 (0.16 - 4.97)

CI=Confidence Interval; A&E=Accident and Emergency; ICU=In tensive Care Unit

Table S7: GRADE clinical evidence profile for wholly attributable alcohol conditions in patients with specific health disorders in the UK hospital system

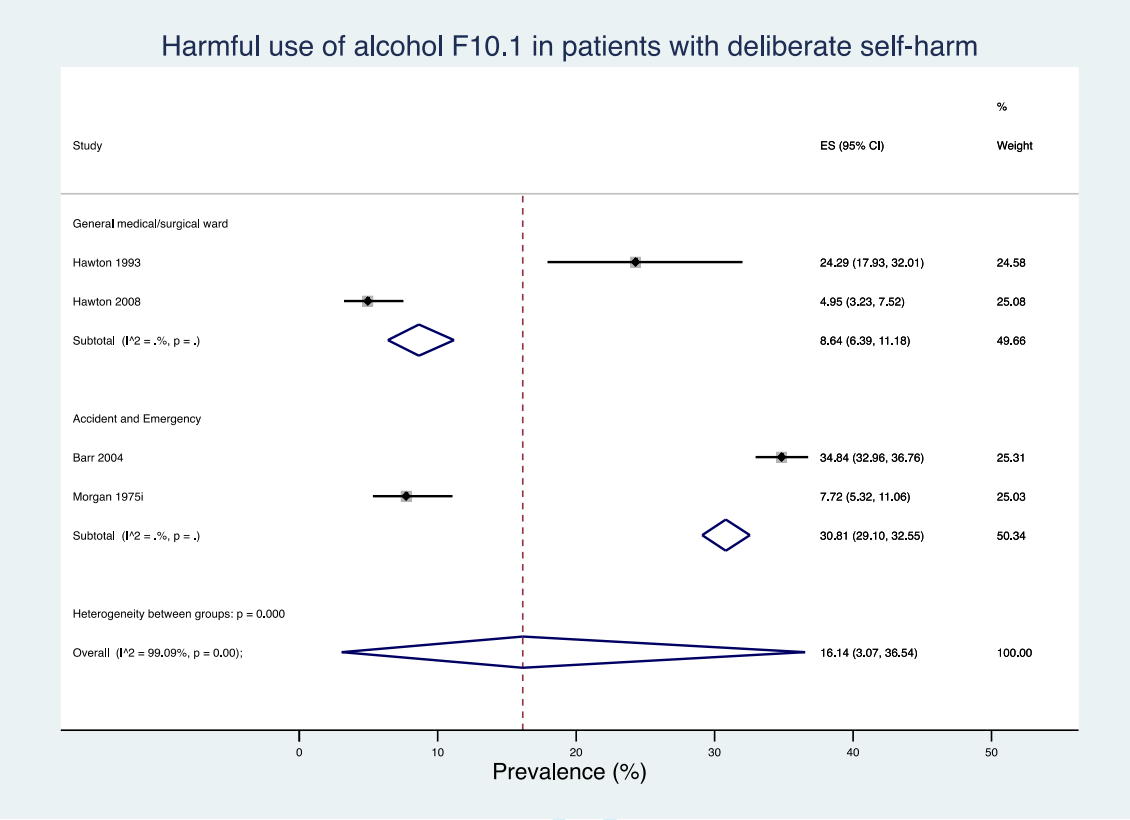
Quality Assessment						Prevalence % (95% CI)	Quality
No of prevalence estimates	Risk of bias	Inconsistency	Indirectness	Imprecision	Publication Bias		
Alcohol Intoxication F10.0 in patients referred to the alcohol liaison nurse							
1	None	N/A	None	Serious	N/A	17.62 (12.89 - 23.61)	VERY LOW
Alcohol Intoxication F10.0 in patients admitted to an A&E observation ward							
1	None	N/A	None	None	N/A	15.89 (14.50 - 17.39)	LOW
Alcohol Intoxication F10.0 in patients who presented with a decreased conscious level							
1	Serious	N/A	None	None	N/A	27.83 (25.29 - 30.51)	VERY LOW
Alcohol Intoxication F10.0 in patients who were private vehicle occupants							
1	Serious	N/A	None	None	N/A	5.75 (3.15 - 10.25)	VERY LOW
Alcohol Intoxication F10.0 in patients with a diagnosis of schizophrenia admitted with parasuicide							
1	Serious	N/A	None	None	N/A	8.16 (5.71 - 11.55)	VERY LOW
Alcohol Intoxication F10.0 in patients admitted under Section 136 of the Mental Health Act							
1	None	N/A	None	Serious	N/A	38.37 (32.50 - 44.59)	VERY LOW
Harmful use of alcohol F10.1 in patients with deliberate self-harm							
4	Serious	Very Serious	None	Very Serious	N/A	16.14 (3.07 - 36.54)	VERY LOW
Harmful use of alcohol F10.1 in patients with self-poisoning							
2	Serious	N/A	None	None	N/A	2.50 (1.01 - 4.54)	VERY LOW
Harmful use of alcohol F10.1 in patients with a psychotic disorder							
1	Very Serious	N/A	None	Serious	N/A	15.19 (8.91 - 24.70)	VERY LOW
Harmful use of alcohol F10.1 in patients with a severe mental illness							
1	Serious	N/A	None	Serious	N/A	33.66 (27.54 - 40.38)	VERY LOW
Harmful use of alcohol F10.1 in patients experiencing a delayed discharge							
1	Serious	N/A	None	Very serious	N/A	43.04 (32.69 - 54.03)	VERY LOW
Harmful use of alcohol F10.1 in patients with a closed head injury							
1	Serious	N/A	None	None	N/A	17.64 (17.17 - 18.12)	VERY LOW
Harmful use of alcohol F10.1 in patients with suspected bone, native joint or soft tissue infection							
1	Serious	N/A	None	Serious	N/A	11.24 (7.32 - 16.89)	VERY LOW
Harmful use of alcohol F10.1 in patients with paracetamol induced hepatotoxicity							
1	Serious	N/A	None	None	N/A	45.27 (41.26 - 49.33)	VERY LOW

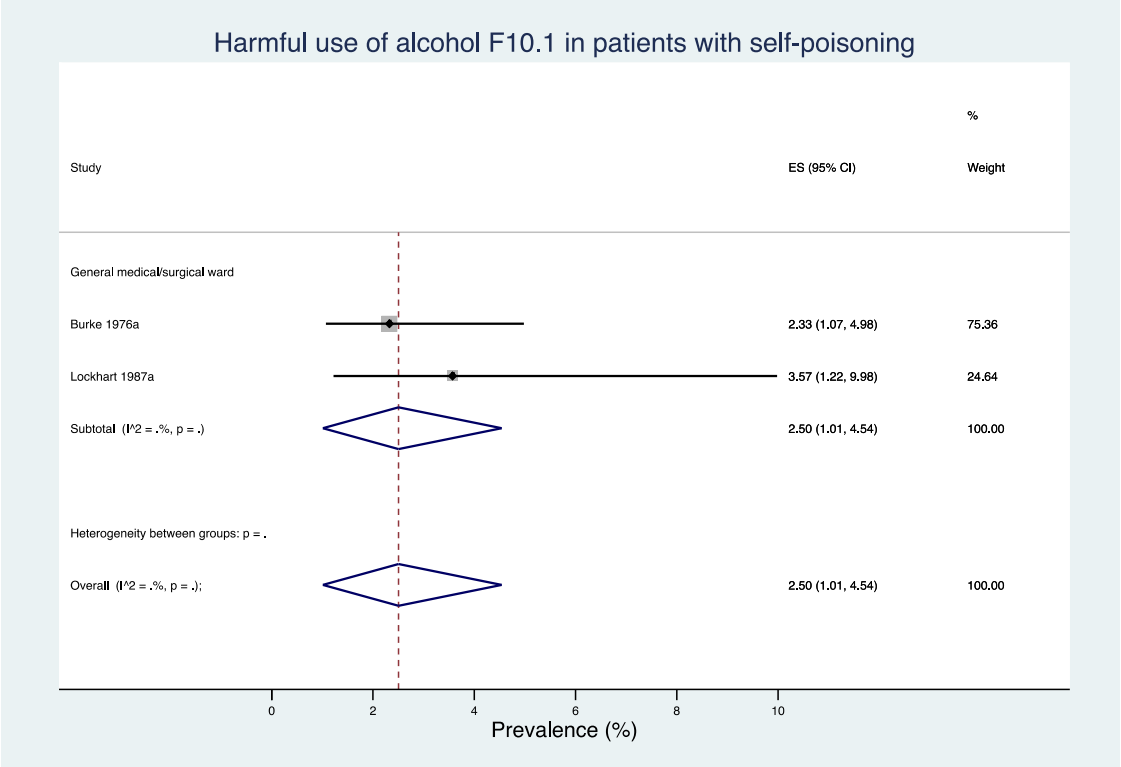
Harmful use of alcohol F10.1 in patients with stroke							
1	None	N/A	None	None	N/A	2.27 (1.88 - 2.73)	LOW
Harmful use of alcohol F10.1 in patients with community acquired pneumonia							
1	Serious	N/A	None	None	N/A	5.52 (4.39 - 6.91)	VERY LOW
Alcohol dependence F10.2 in patients who are homeless							
1	Serious	N/A	None	Serious	N/A	23.64 (16.67 - 32.38)	VERY LOW
Alcohol dependence F10.2 in patients who are doctors							
1	Very Serious	N/A	None	Serious	N/A	20.00 (13.34 - 28.88)	VERY LOW
Alcohol dependence F10.2 in patients with schizophrenia convicted of serious offences							
1	Serious	N/A	None	None	N/A	2.34 (1.60 - 3.41)	VERY LOW
Alcohol dependence F10.2 in patients with a psychotic disorder							
1	Very Serious	N/A	None	Very Serious	N/A	18.99 (11.86 - 28.99)	VERY LOW
Alcohol dependence F10.2 in patients with schizophrenia admitted with parasuicide							
1	Serious	N/A	None	None	N/A	1.46 (0.62 - 3.37)	VERY LOW
Alcohol dependence F10.2 in patients with serious mental illness							
2	Serious	N/A	None	None	N/A	16.76 (13.10 - 20.76)	VERY LOW
Alcohol dependence F10.2 in patients detained under section 5(2) of the Mental Health Act							
1	Serious	N/A	None	Serious	N/A	3.28 (0.90 - 11.19)	VERY LOW
Alcohol dependence F10.2 in patients with personality disorders convicted of serious offences							
1	Serious	N/A	None	None	N/A	6.44 (5.00 - 8.25)	VERY LOW
Alcohol dependence F10.2 in patients with deliberate self-harm							
3	Serious	Serious	None	None	N/A	11.17 (8.35 - 14.32)	VERY LOW
Alcohol dependence F10.2 in patients with hepatitis C virus related decompensated cirrhosis							
1	Serious	N/A	None	None	N/A	50.98 (48.18 - 53.78)	VERY LOW
Alcohol dependence F10.2 in patients with self-poisoning							
1	Very Serious	N/A	None	None	N/A	6.12 (4.88 - 7.65)	VERY LOW
Alcohol dependence F10.2 in patients unless they were admitted with an acute general surgical condition, a social problem, an overdose, or mental illness							
1	Serious	N/A	None	Serious	N/A	16.19 (10.36 - 24.41)	VERY LOW
Alcohol dependence F10.2 in patients whom were poisoned by lysergide							
1	Serious	N/A	None	Serious	N/A	5.00 (1.71 - 13.70)	VERY LOW
Alcohol dependence F10.2 in patients with paracetamol overdose							
1	Serious	N/A	None	None	N/A	9.95 (6.53 - 14.87)	VERY LOW
Alcohol dependence F10.2 in patients with burns							

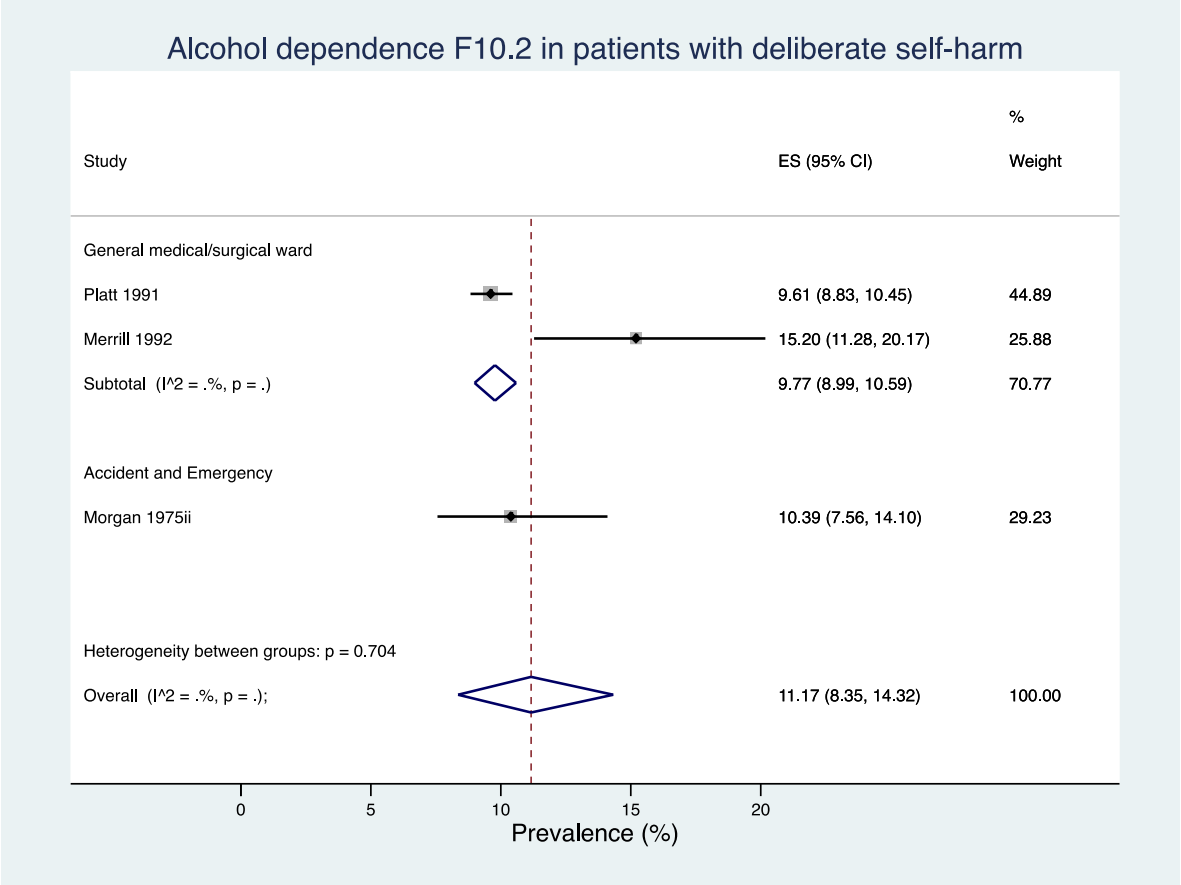
1	Serious	N/A	None	None	N/A	12.30 (10.62 - 14.20)	VERY LOW
Alcohol withdrawal state F10.3 in patients referred to the alcohol liaison nurse							
1	None	N/A	None	None	N/A	9.33 (5.98 - 14.26)	LOW
Alcohol induced psychotic disorder F10.5 in patients with deliberate self-harm							
1	None	N/A	None	None	N/A	8.31 (5.81 - 11.75)	LOW
Alcohol induced amnestic disorder F10.6 in patients referred to the alcohol liaison nurse							
1	None	N/A	None	None	N/A	0.52 (0.09 - 2.88)	LOW
Alcohol induced amnestic disorder F10.6 in patients with acquired brain injury							
1	Serious	N/A	None	Serious	N/A	2.33 (0.41 - 12.06)	VERY LOW
Poisoning by and exposure to alcohol, undetermined intent Y15 in patients with a diagnosis of poisoning							
1	Serious	N/A	None	None	N/A	21.34 (17.68 - 25.53)	VERY LOW
Alcoholic hepatitis K70.1 in patients with decompensated cirrhosis							
2	Serious	N/A	None	None	N/A	9.93 (7.67 - 12.44)	VERY LOW
Alcoholic hepatitis K70.1 in patients admitted to a liver transplant unit							
1	Serious	N/A	None	None	N/A	0.95 (0.50 - 1.79)	VERY LOW
Alcoholic fibrosis and sclerosis of liver K70.2 in patients with Child's Class C liver disease with acute variceal bleeding							
1	Serious	N/A	None	Serious	N/A	51.96 (42.37 - 61.41)	VERY LOW
Alcoholic cirrhosis of liver K70.3 in patients with decompensated cirrhosis							
5	Serious	Very Serious	None	Very Serious	N/A	74.39 (52.82 - 91.16)	VERY LOW
Alcoholic liver disease, unspecified K70.9 in patients with chronic liver disease							
3	Serious	Very Serious	None	Very Serious	N/A	52.70 (29.55 - 75.25)	VERY LOW
Alcoholic liver disease, unspecified K70.9 in patients who received liver transplants							
1	None	N/A	None	None	N/A	17.38 (14.62 -20.55)	VERY LOW
Alcoholic liver disease, unspecified K70.9 in patients with spontaneous bacterial peritonitis in those admitted with ascites							
1	Very Serious	N/A	None	Very Serious	N/A	65.38 (46.22 - 80.59)	VERY LOW
Alcoholic liver disease, unspecified K70.9 in patients referred to the alcohol liaison nurse							
1	None	N/A	None	Serious	N/A	10.88 (7.23 - 16.06)	VERY LOW
Alcoholic liver disease, unspecified K70.9 in patients admitted for a liver transplant assessment							
1	Serious	N/A	None	Serious	N/A	33.03 (24.91 - 42.30)	VERY LOW
Alcoholic liver disease, unspecified K70.9 in patients with a history of variceal bleeding							
1	Very Serious	N/A	None	Very Serious	N/A	56.10 (41.04 - 70.11)	VERY LOW
Alcoholic liver disease, unspecified K70.9 in patients with severe upper gastrointestinal variceal bleeding							
1	None	N/A	None	Serious	N/A	52.87 (45.08 - 60.51)	VERY LOW

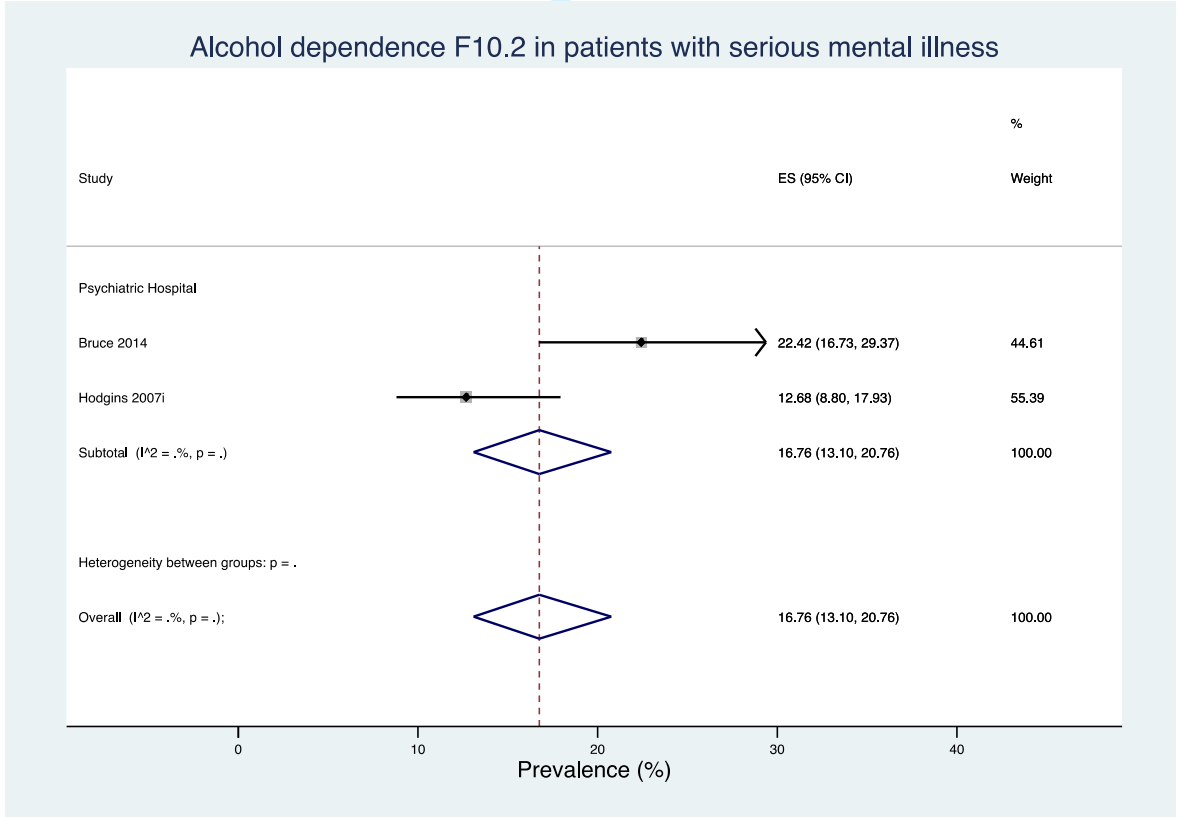
Alcohol-induced acute pancreatitis K85.2 in patients with acute pancreatitis							
7	Serious	Very Serious	None	Serious	N/A	23.55 (17.39 - 30.32)	VERY LOW
Alcohol-induced acute pancreatitis K85.2 in patients with exocrine pancreatic disease							
1	None	N/A	None	Serious	N/A	6.72 (3.45 - 12.71)	VERY LOW
Alcohol-induced chronic pancreatitis K86.0 in patients with chronic pancreatitis							
1	Very Serious	N/A	None	Very Serious	N/A	20.37 (11.77 - 32.90)	VERY LOW
Alcohol-induced chronic pancreatitis K86.0 in patients with exocrine pancreatic disease							
1	None	N/A	None	Serious	N/A	14.29 (9.11 - 21.69)	VERY LOW
Alcoholic gastritis K29.2 in patients who are homeless							
1	Serious	N/A	None	None	N/A	0.91 (0.16 - 4.97)	VERY LOW

Figure S9: Forest plots of meta-analysis for pooled prevalence of wholly attributable alcohol conditions in patients with specific health disorders in the UK hospital system

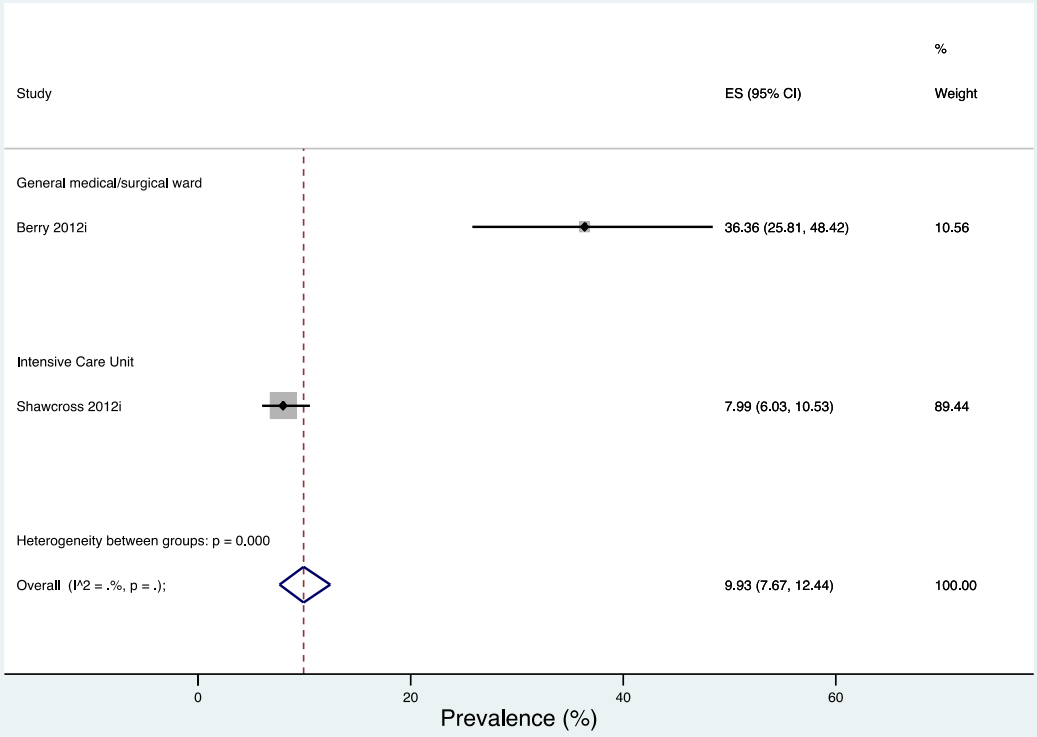




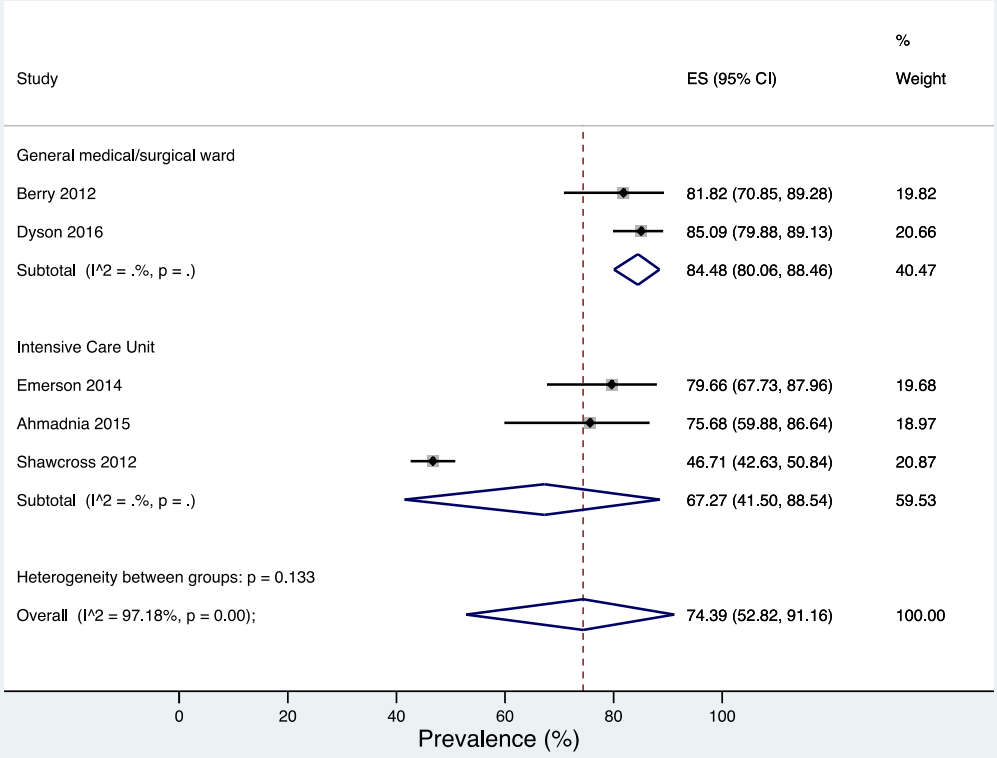

Alcohol dependence F10.2 in patients with deliberate self-harm
Study
ES (95% CI)
%
Weight
General medical/surgical ward
Platt 1991
9.61 (8.83, 10.45)
44.89
Merrill 1992
15.20 (11.28, 20.17)
25.88
Subtotal (I^2 = .%, p = .)
9.77 (8.99, 10.59)
70.77
Accident and Emergency
Morgan 1975ii
10.39 (7.56, 14.10)
29.23
Heterogeneity between groups: p = 0.704
Overall (I^2 = .%, p = .);
11.17 (8.35, 14.32)
100.00
0
5
10
15
20
Prevalence (%)


Alcohol dependence F10.2 in patients with serious mental illness
Study
ES (95% CI)
%
Weight
Psychiatric Hospital
Bruce 2014
22.42 (16.73, 29.37)
44.61
Hodgins 2007i
12.68 (8.80, 17.93)
55.39
Subtotal (I^2 = .%, p = .)
16.76 (13.10, 20.76)
100.00
Heterogeneity between groups: p = .
Overall (I^2 = .%, p = .);
16.76 (13.10, 20.76)
100.00
0
10
20
30
40
Prevalence (%)

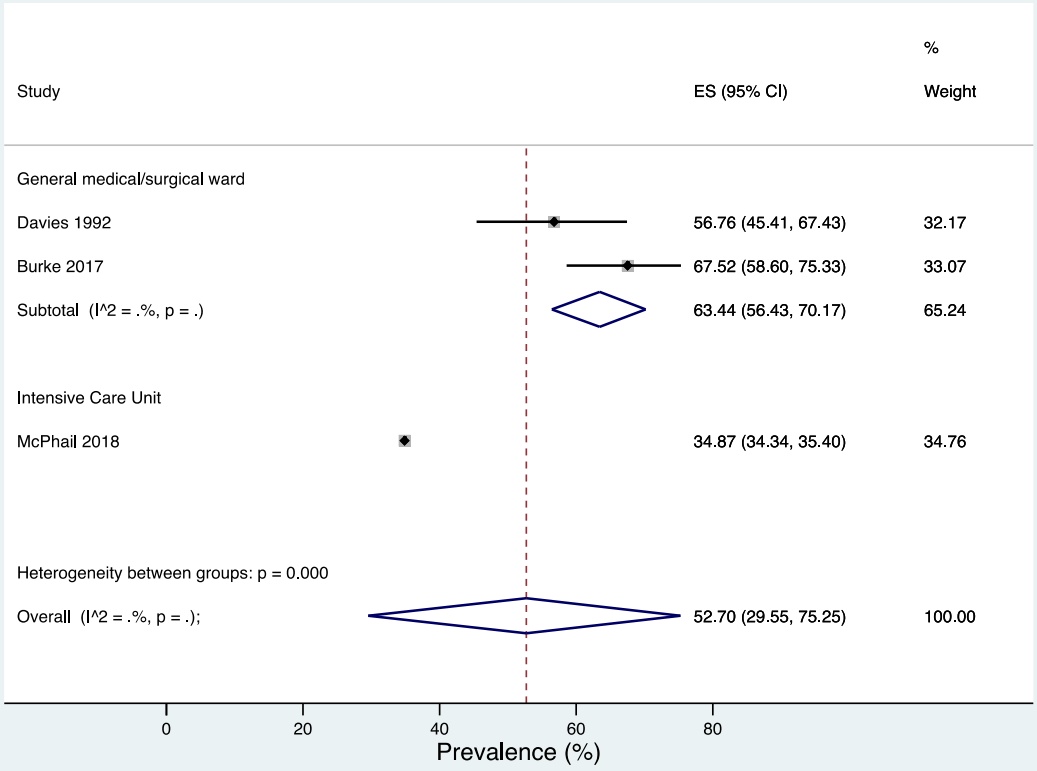
Alcoholic hepatitis K70.1 in patients with decompensated cirrhosis



Alcoholic cirrhosis of the liver K70.3 in patients with decompensated cirrhosis



Alcoholic liver disease, unspecified K70.9 in patients with chronic liver disease



Alcohol-induced acute pancreatitis K85.2 in patients with acute pancreatitis

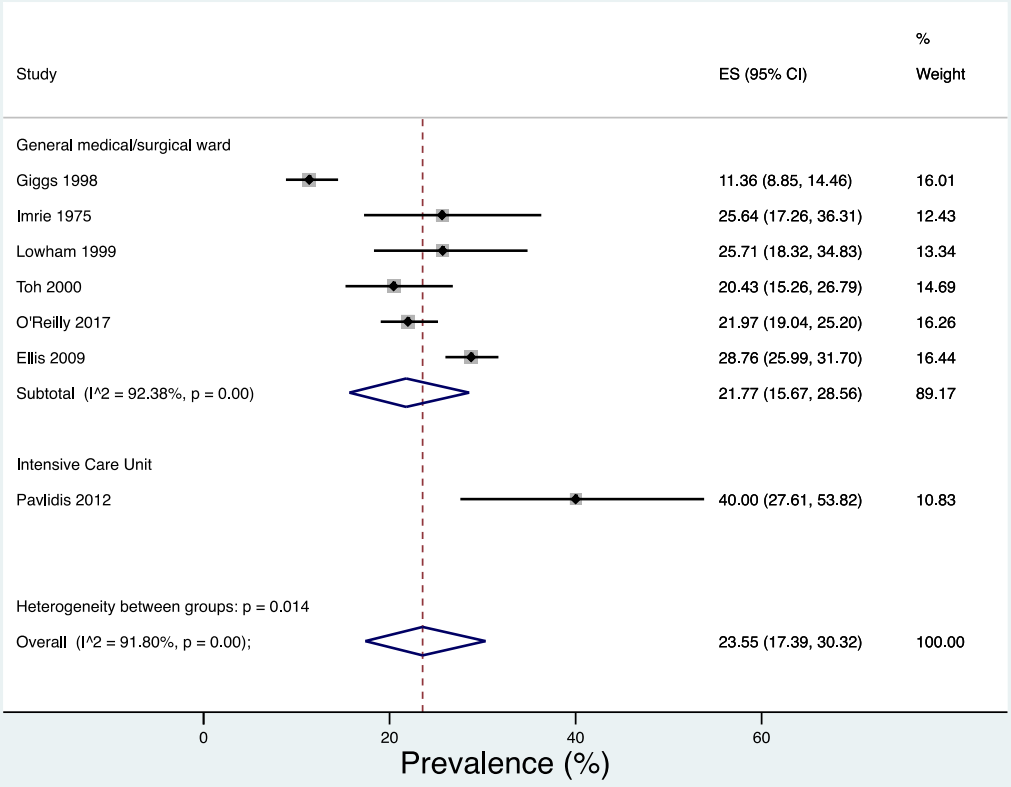


Table S8: Pooled prevalence for wholly attributable alcohol conditions in patients within a specific medical speciality in the UK hospital system

Patients within a specific medical specialty	Specialty	Number of Prevalence Estimates (n)	Prevalence % (95%CI)
Mental and behavioural disorders due to use of alcohol (F10.x)			
Alcohol Intoxication F10.0	Psychogeriatrics	1	2.01 (0.69 - 5.75)*
Harmful use of alcohol F10.1	Psychogeriatrics	1	0.67 (0.12 - 3.70)*
	High-security	2	7.19 (6.03 - 8.43)
	Orthopaedics	1	33.88 (29.23 - 38.85)
Alcohol dependence F10.2	Psychogeriatrics	1	0.67 (0.12 - 3.70)*
	Liaison Psychiatry	1	13.83 (8.26 - 22.24)
Alcohol withdrawal state with delirium F10.4	Psychogeriatrics	1	0.67 (0.12 - 3.70)*
Alcohol induced psychotic disorder F10.5	Psychogeriatrics	1	1.34 (0.37 - 4.76)*
Liver disorders due to alcohol K70.x			
Alcoholic cirrhosis of liver K70.3	Hepatology	1	67.68 (60.88 - 73.80)
Alcoholic liver disease, unspecified K70.9	Gastroenterology	1	14.70 (12.93 - 16.68)

All estimates were deemed *very low* quality according to GRADE unless marked by * which indicates *low* quality

Table S9: GRADE clinical evidence profile for wholly attributable alcohol conditions in patients within a specific medical speciality in the UK hospital system

Quality Assessment						Prevalence % (95% CI)	Quality
No of prevalence estimates	Risk of bias	Inconsistency	Indirectness	Imprecision	Publication Bias		
Alcohol Intoxication F10.0 in psychogeriatric patients							
1	None	N/A	None	None	N/A	2.01 (0.69 - 5.75)	LOW
Harmful use of alcohol F10.1 in psychogeriatric patients							
1	None	N/A	None	None	N/A	0.67 (0.12 - 3.70)	LOW
Harmful use of alcohol F10.1 in high security patients							
2	Serious	N/A	None	None	N/A	7.19 (6.03 - 8.43)	VERY LOW
Harmful use of alcohol F10.1 in orthopaedic patients							
1	Very Serious	N/A	None	None	N/A	33.88 (29.23 - 38.85)	VERY LOW
Alcohol dependence F10.2 in psychogeriatric patients							
1	None	N/A	None	None	N/A	0.67 (0.12 - 3.70)	LOW
Alcohol dependence F10.2 in liaison psychiatry patients							
1	None	N/A	None	Serious	N/A	13.83 (8.26 - 22.24)	VERY LOW
Alcohol withdrawal state with delirium F10.4 in psychogeriatric patients							
1	None	N/A	None	None	N/A	0.67 (0.12 - 3.70)	LOW
Alcohol induced psychotic disorder F10.5 in psychogeriatric patients							
1	None	N/A	None	None	N/A	1.34 (0.37 - 4.76)	LOW
Alcoholic cirrhosis of liver K70.3 in hepatology patients							
1	Serious	N/A	None	Serious	N/A	67.68 (60.88 - 73.80)	VERY LOW
Alcoholic liver disease, unspecified K70.9 in gastroenterology patients							
1	Serious	N/A	None	None	N/A	14.70 (12.93 - 16.68)	VERY LOW

Figure S10: Forest plots of meta-analysis for pooled prevalence of wholly attributable alcohol conditions in patients within specific medical specialties in the UK hospital system

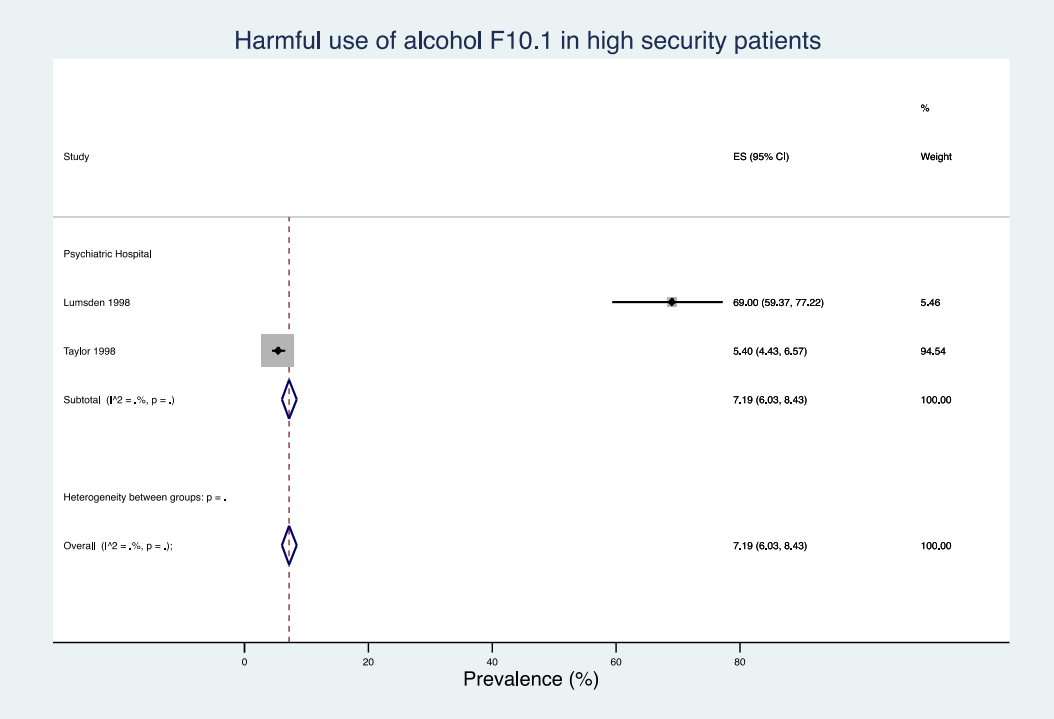
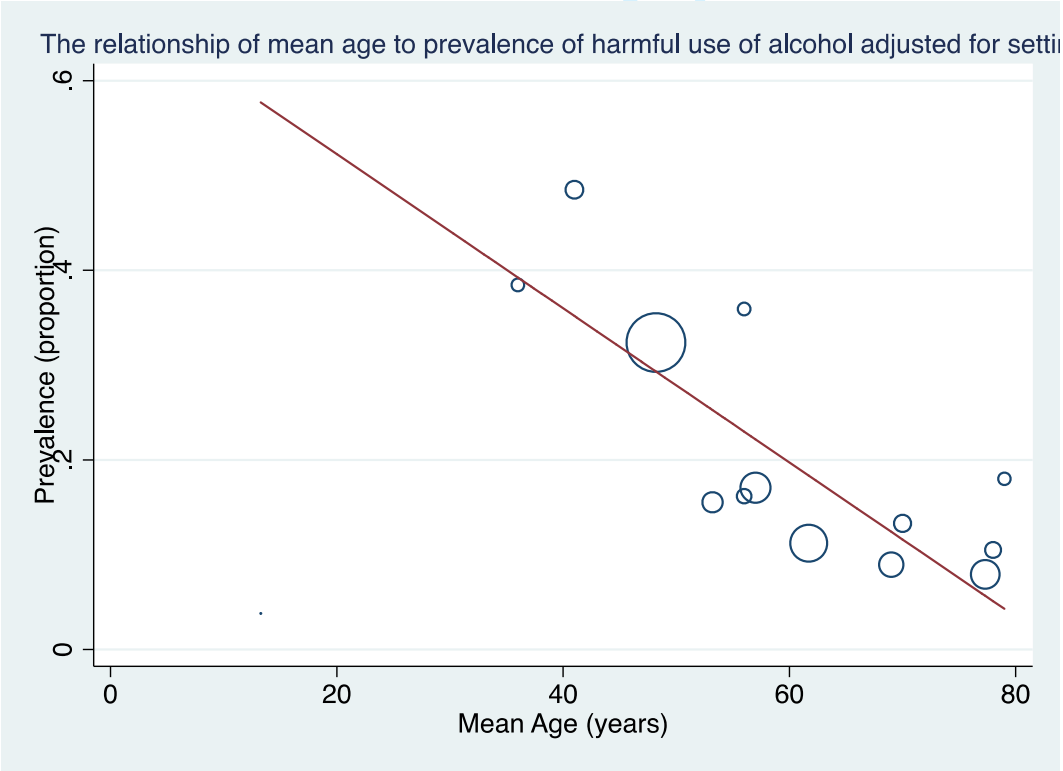


Figure S11: Bubble plots to demonstrate the relationship of mean age to prevalence of wholly attributable alcohol conditions in non-selective patients in the UK hospital system adjusted for setting



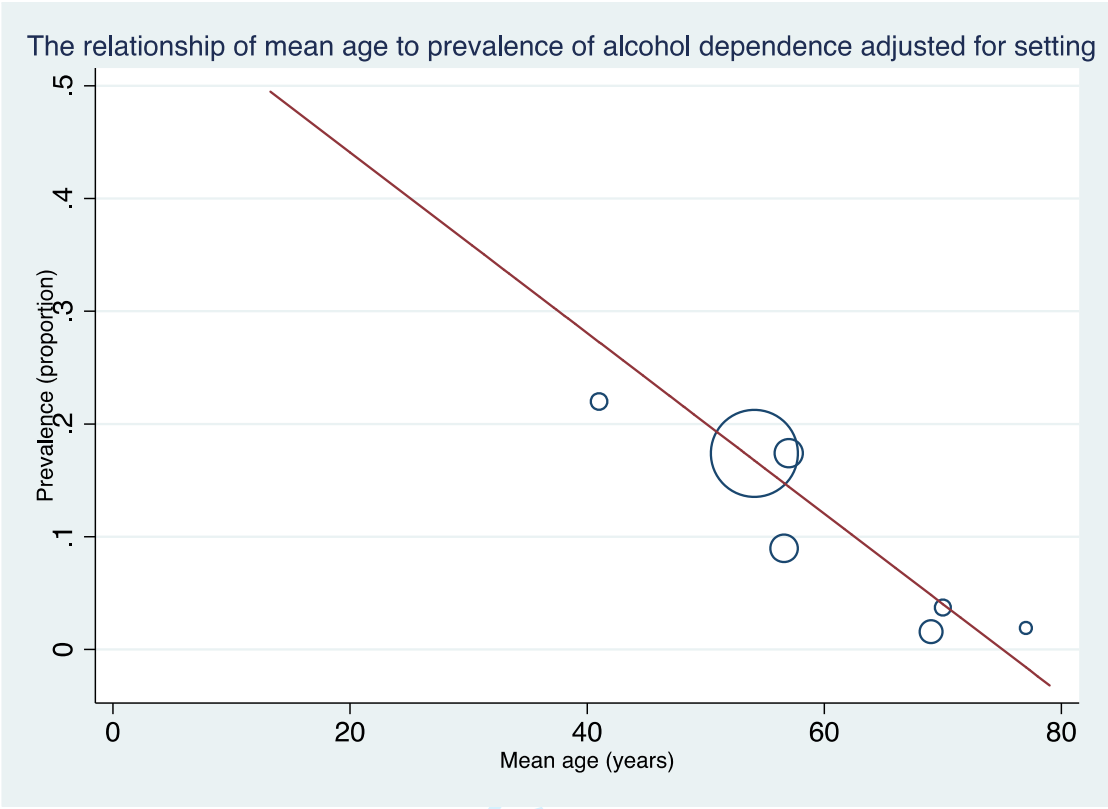
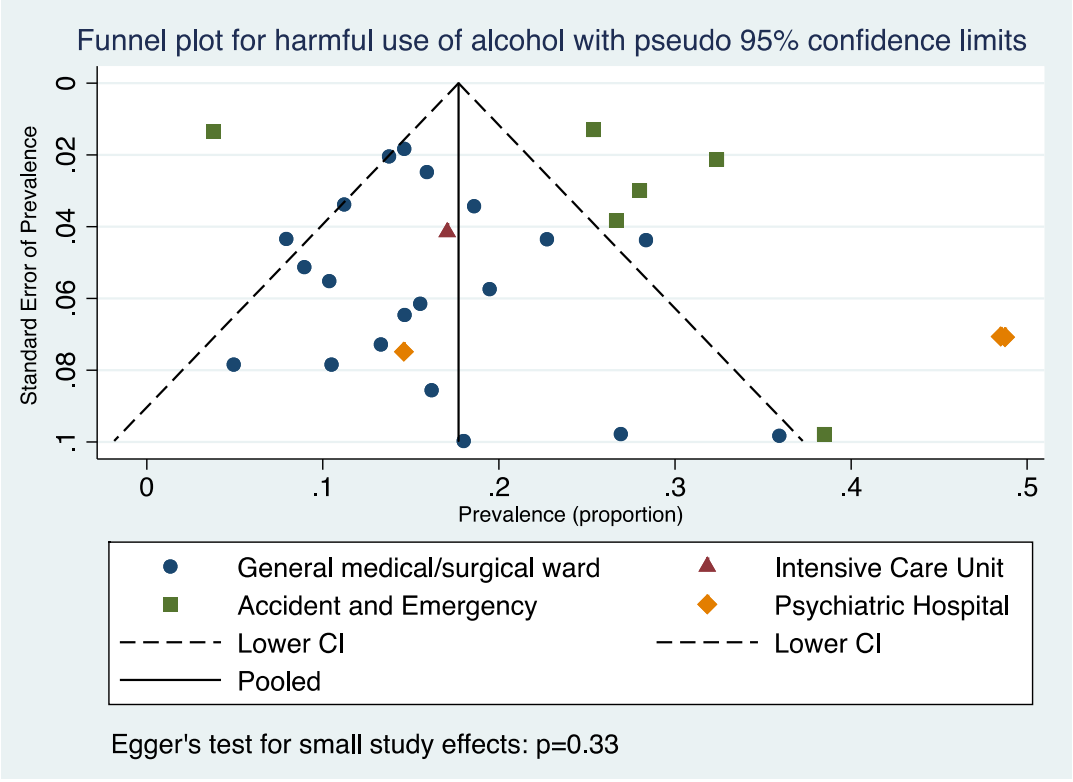
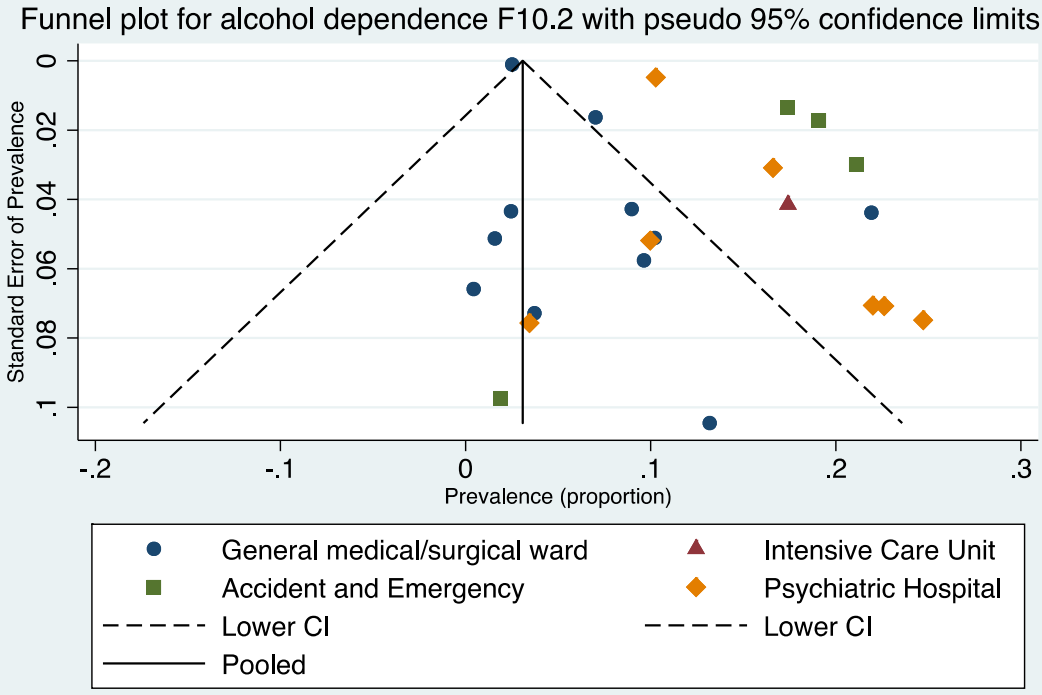


Figure S12: Funnel plot of prevalence estimates for wholly attributable alcohol conditions in non-selective patients in the UK hospital reported by setting





Egger's test for small study effects: p=0.003

Table S10: Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) Checklist

Section/topic	#	Checklist item	Reported on page #
TITLE			
Title	1	Identify the report as a systematic review, meta-analysis, or both.	1
ABSTRACT			
Structured summary	2	Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number.	3
INTRODUCTION			
Rationale	3	Describe the rationale for the review in the context of what is already known.	5-6
Objectives	4	Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS).	6
METHODS			
Protocol and registration	5	Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number.	6; OSM
Eligibility criteria	6	Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale.	6-7
Information sources	7	Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched.	6
Search	8	Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated.	6; OSM
Study selection	9	State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis).	6-7
Data collection process	10	Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators.	7-8; OSM

Data items	11	List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made.	7-8
Risk of bias in individual studies	12	Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis.	8-9
Summary measures	13	State the principal summary measures (e.g., risk ratio, difference in means).	7
Synthesis of results	14	Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I^2) for each meta-analysis.	9-11
Risk of bias across studies	15	Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies).	8-11
Additional analyses	16	Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified.	10-11
RESULTS			
Study selection	17	Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram.	12
Study characteristics	18	For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations.	Table One
Risk of bias within studies	19	Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12).	Table One; OSM
Results of individual studies	20	For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot.	Figure three and four; OSM
Synthesis of results	21	Present results of each meta-analysis done, including confidence intervals and measures of consistency.	12-14Figure three and four; OSM
Risk of bias across studies	22	Present results of any assessment of risk of bias across studies (see Item 15).	12-14; OSM
Additional analysis	23	Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]).	14-15
DISCUSSION			

Summary of evidence	24	Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers).	16
Limitations	25	Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias).	17-18
Conclusions	26	Provide a general interpretation of the results in the context of other evidence, and implications for future research.	18-20
FUNDING			
Funding	27	Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review.	2

Table S11: Meta-analysis of Observational Studies in Epidemiology (MOOSE) checklist

Item No	Recommendation	Reported on Page No
Reporting of background should include		
1	Problem definition	6
2	Hypothesis statement	6
3	Description of study outcome(s)	7
4	Type of exposure or intervention used	7
5	Type of study designs used	6-7
6	Study population	6-7
Reporting of search strategy should include		
7	Qualifications of searchers (eg, librarians and investigators)	6
8	Search strategy, including time period included in the synthesis and key words	6; OSM
9	Effort to include all available studies, including contact with authors	6-7
10	Databases and registries searched	6
11	Search software used, name and version, including special features used (eg, explosion)	6; OSM
12	Use of hand searching (eg, reference lists of obtained articles)	6-7
13	List of citations located and those excluded, including justification	12; OSM
14	Method of addressing articles published in languages other than English	6; 17
15	Method of handling abstracts and unpublished studies	7
16	Description of any contact with authors	7
Reporting of methods should include		
17	Description of relevance or appropriateness of studies assembled for assessing the hypothesis to be tested	6-7
18	Rationale for the selection and coding of data (eg, sound clinical principles or convenience)	7-8
19	Documentation of how data were classified and coded (eg, multiple raters, blinding and interrater reliability)	7-8
20	Assessment of confounding (eg, comparability of cases and controls in studies where appropriate)	N/A
21	Assessment of study quality, including blinding of quality assessors, stratification or regression on possible predictors of study results	8-9
22	Assessment of heterogeneity	10-11
23	Description of statistical methods (eg, complete description of fixed or random effects models, justification of whether the chosen models account for predictors of study results, dose-response models, or cumulative meta-analysis) in sufficient detail to be replicated	10-12
24	Provision of appropriate tables and graphics	33-51
Reporting of results should include		
25	Graphic summarizing individual study estimates and overall estimate	50-51; OSM
26	Table giving descriptive information for each study included	45; OSM

27	Results of sensitivity testing (eg, subgroup analysis)	14-15; 46-47
28	Indication of statistical uncertainty of findings	Throughout; 14-15

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